Music, Myth, and Metaphysics: Harmony in Twelfth-Century Cosmology and Natural Philosophy

by

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ABSTRACT

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This study engages a network of music, myth, and metaphysics within late-ancient and twelfth-century music theory and cosmology. It traces the development, expansion, and demise of a (natural-) philosophical harmonic speculation that stems largely from an *a priori* commitment to a harmonic cosmology with its deepest roots in Plato's *Timaeus*. It argues that music theory not only allowed twelfth-century thinkers to conceptualize the fabric of the universe, but it also provided a hermeneutic tool for interpreting the ancient and late-ancient texts that offered detailed theories of the world's construction. The twin goals of this study are thus philosophical and musicological: firstly and philosophically, to analyze and re-assert the importance of musical speculation in the writings of the self-styled *physici*, who probed the physical world and its metaphysical foundations during the 'Twelfth-Century Renaissance'; secondly and musicologically, to document the sources and scope of this musical speculation and to situate it within the larger tradition of 'speculative music theory.'

The first part of the thesis (chapters one and two) disentangles the knotty question of sources for and connections between the late-ancient texts (by Calcidius, Macrobius, and Boethius) that form the background of twelfth-century thought, and it sketches the proper domain of musical thought by tracing the expansion of music's role in quadrivial and natural-philosophical contexts from late-ancient encyclopedism though various twelfth-century *divisiones scientiae*. The second part of the thesis (chapters three through five) assembles and analyzes the direct evidence for twelfth-century harmonic theory. These chapters, heuristically organized around the Boethian tripartition of music, present an anagogic ascent *per aspera ad astra*. Chapter three (*musica instrumentalis*) highlights the occasional and perhaps surprising employ of practical, technical music theory in cosmological contexts, and focuses on the epistemological foundations of hearing and the ontological status granted to the sonorous 'objects' of hearing. Chapter four (*musica humana*) targets the anthropological, psychological, and ethical implications of musical relations in and between body and soul. Finally, chapter five (*musica mundana*) outlines the cosmological framework, the *anima mundi* in particular, that underpins the concordant machinations of the *machina mundi* in all its manifestations.

ACKNOWLEDGEMENTS

Aestuante aestiuo in Leone sole,
iaciente iacula numquam beneuole,
dedi has primitias messas magna mole
magnifico magistro dicens ‘lege, tolle!’

Laetabundus, subito onere leuatus,
deo egi gratias, summe eleuatus,
renouatus animo, carne fatigatus,
quoniam ab arduis rebus feriatus.

Si in istis uobis est quid utilitatis,
laudes celeberrimae nunquam erunt satis,
omnes quas ad magistros meos offeratis.
Nullum donum maius est quam humilitatis.

Quorum eloquentia me locupletaui,
quorum et acumine me acuminaui,
eos coram omnibus ego liberaui
a quocumque uitio quod hic perpetraui.

Nam si egi prudenter de Boethianis,
si nil forte dixi quo reueler inanis,
tunc hoc totum debetur studiis humanis
mi consiliarii, magistri Iohannis.

Si umquam de musica commode tractaui,
fecit hanc concordiam (cum labore graui)
Gabriela magistra, docens uoce suaui
λείμματος subtilia et sesquioctaui.

Abelardus mihi est semper submolestus;
causa est insomniae, causa indigestus.
Qui (mireris) medicus tandem est suggestus?
Quidam rex eruditus multumque modestus.

Totam philosophiam uerbis tectam densis
docuit me sapiens senex Carnotensis,
cui quoque domus est urbs Atheniensis,
per quem mundo notus est glossator Conchensis.

Et Latinas regulas (ignoscat offensis!)
docuit me peritus uir Lancastriensis.
Ille est dignissimus laudibus immensis,
quippe qui sic clueat uir Latiniensis.

Apud scholam inclitam Cantabrigiensem
commoratus dulciter circa Maiam mensem
lectione fructus sum, didicique sensim
animum acuere ut acutum ensem.

Vnde ago gratias alteri Iohanni,
ad quem nos contulimus quasi Porretani;
transfretani uenimus atque transmontani,
umeris gigantium insidentes nani.

Adeo contortus est scholae apparatus
ut se possit soluere nemo implicatus,
nec mi esset libertas multos post conatus,
si non essem gratia Gratiae saluatus.

Quondam dixit sapiens uoce cum superna:
'poculis accenditur animi lucerna.'
Sic amicis soluatur gratia aeterna,
ut qui lucubrauerint mecum in taberna.

Meaeque familiae numquam obliuiscor,
qua suffultus firmiter finem adipiscor;
totius prosapiae laete reminiscor
dum ad res scholasticas ego proficiscor.

Hoc complecti nequii uerbis manifestis
sine beneficio feminae caelestis,
immo caelestissimae, et sit Deus testis:
ea est uxorcula meaque Alcestis.

Vxori meae hoc opus libens laetusque do atque dedico.

CONTENTS

LIST OF FIGURES

ABBREVIATIONS

Citations are generally given in the form: book.chapter.verse (or some variation thereof); page(s) and line number(s) of modern editions are only supplied when necessary, e.g., when editions are lineated by page or otherwise lack sufficiently specific internal divisions. If the page and line numbers supplement a book and/or chapter reference, they follow in parentheses or brackets as appropriate.

Abelardus, *Dial.* = L.M. De Rijk, *Petrus Abaelardus. Dialectica: First Complete Edition of the Parisian Manuscript* (Assen: Van Gorcum, 1956; rev. ed. 1970).

Abelardus, *LI1* = Bernhard Geyer, ed., *Peter Abaelards Philosophische Schriften. I. Die Logica 'Ingredientibus'. 1. Die Glossen zu Porphyrius*, Beiträge zur Geschichte der Philosophie und Theologie des Mittelalters 21.1 (Münster: Aschendorff, 1919).

Abelardus, *LI2* = Bernhard Geyer, ed., *Peter Abaelards Philosophische Schriften. I. Die Logica 'Ingredientibus'. 2. Die Glossen zu den Kategorien*, Beiträge zur Geschichte der Philosophie und Theologie des Mittelalters 21.2 (Münster: Aschendorff, 1921).

Abelardus, *TChr* = *Theologia Christiana* in E.M. Buytaert, ed., *Petri Abaelardi Opera theologica II*, Corpus Christianorum. Continuatio Mediaevalis 12 (Turnhout: Brepols, 1969).

Abelardus, *TSch* = *Theologia 'Scholarium'* in E.M. Buytaert and C.J. Mews, eds., *Petri Abaelardi Opera theologica III*, Corpus Christianorum. Continuatio Mediaevalis 13 (Turnhout: Brepols, 1987), 313–549.

Abelardus, *TSum* = *Theologia 'Summi boni'* in Buytaert and Mews, *Petri Abaelardi Opera theologica III*, 85–201.

Adelardus, *De eod. et diu.* = *De eodem et diuerso* in Charles Burnett, ed. and trans., *Adelard of Bath, Conversations with His Nephew: On the Same and the Different, Questions on Natural Science and On Birds* (Cambridge: Cambridge University Press, 1998), 1–79.

Adelardus, *Quaest. nat.* = *Quaestiones naturales* in Burnett, *Conversations*, 81–235.

Alanus de Insulis, *Anticl.* = Robert Bossuat, ed., *Alain de Lille. Anticlaudianus: texte critique, avec une introduction et des tables* (Paris: J. Vrin, 1955), corrected against the forthcoming edition and translation by Winthrop Wetherbee III (in preparation).

Alanus de Insulis, *De pl. nat.* = Nikolaus M. Häring, "Alan of Lille, De planctu Naturae," *Studi medievali* 19 (1978): 797–879, corrected against the forthcoming edition and translation by Winthrop Wetherbee III (in preparation).

Alcinous, *Didask.* = John Whittaker, ed., *Alcinoos. Enseignment des doctrines de Platon*, trans. Pierre Louis (Paris: Belles lettres, 1990).

Ammonius, *In Isag.* = Adolf Busse, ed., *Ammonii In Porphyrii Isagogen sive V voces*, Commentaria in Aristotelem Graeca 4.3 (Berlin: Reimer, 1981).

Anonymus, *Exp. in Mart.* = *Expositio super librum Martiani Capelli de nuptiis phylologie* iuxta Florence, Bib. Naz. Centrale, Conv. Soppr. I.1.28, ff. 49r–64v, et Zwettl, Stiftsbibliothek 313, ff. 142v–179v.

Anonymus, *Glos. Colonienses sup. Macr.* = Irene Caiazzo, *Lectures médiévales de Macrobe. Les* Glosae Colonienses super Macrobium, Études de philosophie médiévale 83 (Paris: J. Vrin, 2002).

Anonymus, *In inst. mus.* = Alexander Rausch, "Der Boethius-Kommentar in der Handschrift St. Florian XI 282," *Studien zur Musikwissenschaft: Beihefte der Denkmäler der Tonkunst in Österreich* 48 (2002): 7–83.

Aristoxenus, *El. har.* = Rosetta Da Rios, ed., *Aristoxeni Elementa Harmonics*, Scriptores Graeci et Latini consilio Academiae Lynceorum editi (Rome: Typis publicae officinae polygraphicae, 1954).

Augustinus, *Trin.* = W.J. Mountain, *Sancti Aurelii Augustini De trinitate libri XV*, Corpus christianorum. Series Latina, 50–50A (Turnhout: Brepols, 1968).

Bernardus Carnotensis, *Bernardi Glosae super Tim.* = Paul Edward Dutton, ed., *The* Glosae super Platonem *of Bernard of Chartres*, Studies and texts 107 (Toronto: Pontifical Institute of Mediaeval Studies, 1991).

Bernardus Silvestris, *Comm. in Mart.* = Haijo Jan Westra, ed., *The Commentary on Martianus Capella's* De nuptiis Philologiae et Mercurii *Attributed to Bernardus Silvestris*, Studies and Texts 80 (Toronto: Pontifical Institute of Mediaeval Studies, 1986).

Bernardus Silvestris, *Cos.* = Peter Dronke, ed., *Bernardus Silvestris. Cosmographia* (Leiden: E.J. Brill, 1978).

Boethius, *Cons. phil.* = Claudi Moreschini, ed., *Boethius. De consolatione philosophiae. Opuscula theologica*, Bibliotheca scriptorum Graecorum et Romanorum Teubneriana (Munich and Leipzig: K.G. Saur, 2005), 1–162.

Boethius, *De trin.* = Moreschini, *Boethius. De consolatione philosophiae. Opuscula theologica*, 165–181.

Boethius, *In Isag.* = Samuel Brandt, ed., *Anicii Manlii Severini Boethii In Isagogen Porphyrii commenta*, Corpus Scriptorum Ecclesiasticorum Latinorum 48 (Vienna: F. Tempsky, 1906).

Boethius, *In Perih.* = Carol Meiser, ed., *Anicii Manlii Severini Boetii commentarii in librum Aristotelis ΠΕΡΙ ΕΡΜΗΝΕΙΑΣ* (Leipzig: B. G. Teubner, 1877 and 1880).

Boethius, *Inst. ar.* = Henry Oosthout and Iohannes Schilling, eds., *Anicii Manlii Severini Boethii De institutione arithmetica*, Corpus Christianorum. Series Latina, 94A (Turnhout: Brepols, 1999).

Boethius, *Inst. mus.* = Godfrey Friedlein, ed., *Anicii Manlii Torquati Severini Boetii De institutione arithmetica, libri duo. De institutione musica, libri quinque*, Bibliotheca scriptorum Graecorum et Romanorum Teubneriana (Leipzig: B. G. Teubner, 1867).

Calcidius, *In Tim.* = J.H. Waszink, ed., *Timaeus a Calcidio translatus commentarioque instructus*, 2nd ed., Plato Latinus 4 (London: The Warburg Institute, 1975).

Eriugena, *De imag.* = Maïeul Cappuyns, "Le 'De imagine' de Grégoire de Nysse traduit par Jean Scot Érigène," *Recherches de théologie ancienne et médiévale* 32 (1965): 205–262.

Gregory of Nyssa, *De hom. op.* = *S. Gregorii Nysseni De hominis opificio*, *PG* 44, 123D–255C.

Guillelmus a Sancto Theodorico, *De nat. corp. et an.* = Michel Lemoine, ed., *Guillelmi a Sancto Theodorico De natura corporis et animae*, Auteurs Latins du Moyen Âge (Paris: Belles lettres, 1988), 93–146.

Guillelmus de Conchis, *Drag.* = Italo Ronca, ed., *Guillelmi de Conchis Dragmation philosophiae*, Corpus Christianorum. Continuatio Mediaevalis 152 (Turnhout: Brepols, 1997).

Guillelmus de Conchis, *Glos. sup. Macr.* = *Glosae super Macrobium*, transc. Helen Rodnite Lemay (forthcoming in the *Guillelmi de Conchis Opera omnia*, Corpus Christianorum, Continuatio Mediaeualis) – Rodnite-Lemay's transcriptions have been checked and corrected against the manuscripts, when necessary.

Guillelmus de Conchis, *Glosae in Boet.* = Lodi Nauta, ed., *Guillelmi de Conchis Glosae super Boetium*, Corpus Christianorum. Continuatio Mediaevalis 158 (Turnhout: Brepols, 1999).

Guillelmus de Conchis, *Glosulae in Prisc.* = Florence, Biblioteca Laurenziana, San Marco 310 (*uersio prior*); Paris, Bibliothèque nationale, lat. 15130 (*uersio altera*).

Guillelmus de Conchis, *Guillelmi Glosae super Tim.* = Édouard Jeauneau, ed., *Guillelmi de Conchis Glosae super Platonem*, Corpus Christianorum. Continuatio Mediaevalis 203 (Turnhout: Brepols, 2006).

Guillelmus de Conchis, *Phil.* = PL 172, 39–102; corrected against Gregor Maurach, ed., *Wilhelm von Conches. Philosophia* (Pretoria: University of South Africa, 1980).

Hisdosus, *De anima mundi in Tim.* = Paris, Bibliothèque nationale, lat. 8624, 17r–22r.

Honorius Augustodunensis, *Imago mundi* = Valerie Flint, "Honorius Augustodunensis. *Imago mundi*," *Archives d'histoire doctrinale et litteraire du Moyen Age* 49 (1982): 7–153.

Hugo de S. Victore, *Did.* = Charles Henry Buttimer, ed., *Hugonis de Sancto Victore Didascalicon De studio legendi: A Critical Text*, Studies in Medieval and Renaissance Latin 10 (Washington, D.C.: The Catholic University Press, 1939).

Iamblichus, *De comm. math. sc.* = Nicolaus Festa and Ulrich Klein, eds., *Iamblichi De communi mathematica scientia liber* (Stuttgart: Teubner, 1975).

Isaac of Stella, *Ep. de an.* = PL 194, 1875–1890, corrected against the forthcoming edition of Caterina Tarlazzi.

Macrobius, *In Som. Scip.* = James Willis, ed., *Ambrosii Theodosii Macrobii Commentarii in Somnium Scipionis*, Bibliotheca scriptorum Graecorum et Romanorum Teubneriana (Leipzig: B.G. Teubner, 1963).

Martianus, *De nuptiis* = James Willis, ed., *Martianus Capella*, Bibliotheca scriptorum Graecorum et Romanorum Teubneriana (Leipzig: B.G. Teubner, 1983).

Nemesius, *Prem. phys.* = Karl Burkhard, ed., *Nemesii episcopi Premnon physicon siue ΠΕΡΙ ΦΥΣΕΩΣ ΑΝΘΡΩΠΟΥ liber a N. Alfano archiepiscopo Salerni in Latinum translatus*, Bibliotheca scriptorum Graecorum et Romanorum Teubneriana (Leipzig: B.G. Teubner, 1917).

Nicomachus, *Harm.* = Karl von Jan, ed., *Musici scriptores graeci. Aristoteles, Euclides, Nicomachus, Bacchius, Gaudentius, Alypius, et melodiarum ueterum quidquid exstat* (Leipzig: B.G. Teubner, 1895), 235–265.

Nicomachus, *Intr. ar.* = Richard Hoche, ed., *Nicomachi Geraseni Pythagorei Introductionis arithmeticae libri duo*, Bibliotheca scriptorum Graecorum et Romanorum Teubneriana (Leipzig: B. G. Teubner, 1866).

PG = *Patrologia Graeca*.

Philoponus, *In de An.* = Michael Hayduck, ed., *Ioannis Philoponi in Aristotelis de anima libros commentaria*, Commentaria in Aristotelem Graeca 15 (Berlin: Reimer, 1897).

PL = *Patrologia Latina*.

Plato, *Lach.*, *Alc. 1*, *Crat.*, *Theaet.*, *Prot.*, *Phaedo*, *Tim.*, *Sym.*, *Phaedrus*, *Leg.*, *Rep.* = John Burnet, ed., *Platonis Opera*, Scriptorum classicorum bibliotheca Oxoniensis (Oxford: Clarendon Press, 1900–1907).

Porphyrius, *In Ptolemei Harm.* = Ingemar Düring, *Porphyrios Kommentar zur Harmonielehre des Ptolemaios*, Göteborgs Högskolas Årsskrift 38 (Göteborg: Elanders Boktryckeri, 1932).

Proclus, *In Remp.* = Wilhelm Kroll, ed., *Procli Diadochi in Platonis Rem publicam commenarii*, 2 vols., Bibliotheca Scriptorum Graecorum et Romanorum Teubneriana (Leipzig: Teubner, 1899–1901).

Proclus, *In Tim.* = Ernst Diehls, ed., *Procli Diadochi in Platonis Timaeum commentaria*, 3 vols., Bibliotheca scriptorum Graecorum et Romanorum Teubneriana (Liepzig: B.G. Teubner, 1903–1906).

Ps.-Euclid, *Sec. can.* = André Barbera, *The Euclidean Division of the Canon: Greek and Latin Sources*, Greek and Latin Music Theory 8 (Lincoln, NB: University of Nebraska Press, 1991), 114–184.

Ptolemeus, *Harm.* = Ingemar Düring, *Die Harmonielehre des Klaudios Ptolemaios*, Göteborgs Högskolas Årsskrift 36 (Göteborg: Elanders Boktryckeri, 1930).

Theon Smyrnensis, *Exp.* = Edward Hiller, ed., *Theonis Smyrnaei philosophi Platonici Expositio rerum mathematicarum ad legendum Platonem utilium*, Bibliotheca scriptorum Graecorum et Romanorum Teubneriana (Leipzig: B.G. Teubner, 1878).

PREFACE

The renowned twelfth-century *magister*, Thierry of Chartres, tantalizingly promised that his hexameral commentary, the *Tractatus de sex dierum operibus*, would offer four kinds of arguments (*probationes*) to bring his readers to knowledge of their creator: 'the proofs of arithmetic and music, geometry and astronomy.'[1] The *probatio musicalis*, however, remains an empty promise, for the extant *Tractatus* trails off, mid-argument, before even the first arithmetical proof has proved its point. Regrettably, the twelfth century is littered with such broken promises – teasing references to works that perhaps were never written, perhaps have slipped through the fickle fingers of Fortuna and are lost forever, or perhaps still lie undisturbed and undiscovered, maybe even in plain sight, waiting for the right reader to see for the first time what has indeed been under the eyes of many, but never been seen before.[2] Examples are numerous. The *Commentum in Martianum* that may or may not be by Bernard Silvestris begs off a serious discussion of the soul's *uitalis spiritus* and directs the reader instead to his commentary on the Timaeus: *Hec de uitali spiritu. Super Platonem enim hec latius executi sumus*.[3] The anonymous author of a now fragmentary commentary on Boethius' *Consolatio philosophiae* avers the same in his quick remarks on *hyle* or primordial matter: *Quid sit yle non hic dicetur, sed in Platonis Thimeo*.[4] Similarly, an unpublished twelfth-century commentator on Plato's *Timaeus*, a commentator only distinguishable from that most prolific of medieval authors, 'anonymous', because he happens to tell us his name, Hisdosus, proudly refers his readers to his own refutation of mathematicians who claim that a disjunct harmonic proportion is impossible: *quos in Arismetica euidentissime confutamus*.[5] In short, each new discovery seems to create as many gaps as it fills – or, to borrow a metaphor from Boethius, with every uncertainty that we pare away,

[1] Nikolaus M. Häring, ed., *Commentaries on Boethius by Thierry of Chartres and his School*, Studies and Texts 20 (Toronto: Pontifical Institute of Mediaeval Studies, 1971), *Tractatus de sex dierum operibus*, 56.

[2] To paraphrase the legal scholar, F.W. Maitland, quoted in David Ganz, "Latin Palaeography since Bischoff," in *Omnia disce: Medieval Studies in Memory of Leonard Boyle, O.P.* Ed. Anne J. Duggan, Joan Greatrex, and Brenda Bolton (Aldershot: Ashgate, 2005), 107.

[3] *Comm. in Mart.* 8.1043–1044.

[4] Biblioteca Apostolica Vaticana, Codex Vaticanus latinus 919, 198va.

[5] Paris, Bibliothèque nationale, lat. 8624, 20r.

innumerable others, like Hydra-heads, spring up in its place (*Cons. phil.* 4.6.3).

Our knowledge of the twelfth-century 'Platonic' commentary tradition is thus necessarily imperfect, and as new texts come to light, our assessment of its terrain will continue to change and, we hope, improve. But despite the gaps (both known and unknown), the extant tradition still allows us to respond to an even more fundamental question posed, now upwards of thirty years ago, by Lawrence Gushee. In his magisterial survey of medieval musical writings, Gushee famously called attention to an 'extremely odd facet' of the twelfth century and posed the question bluntly: 'Where are the writers on music [. . .]?'[6] Exploring this question and its implications for the history of music theory led Gushee to the doorstep of the so-called 'School of Chartres,' but he did not enter, warded off perhaps by its intimidating philosophical bent, noting that 'while music's position in the liberal arts was strong [at Chartres], the texts used may rarely have had relevance to the practical concerns of standard plain-chant. The notorious (neo) Platonism of the intellectuals of Chartres must have something to do with this.'[7] On one level Gushee was absolutely correct: the often speculative and generally non-practical deployment of music theory in the writings of many twelfth-century authors – especially, but not only, those commonly associated with the 'School of Chartres' – had everything to do with the 'notorious (neo) Platonism' that characterizes much (though certainly not all) of twelfth-century thought. And I must caution that if we neglect as extra-musical or as somehow less relevant to musicology medieval musical writings that do not directly bear on the 'practical concerns of standard plain-chant' (and Gushee is right that these twelfth-century authors have little to say on such matters), then we have done ourselves and our discipline a grand disservice. For although Bernard of Chartres, William of Conches, Bernard Silvestris, and a host of anonymous commentators may not – or at least not in any strong sense – be *musici* in the same way that many were praised by their contemporaries as *philosophi* and *grammatici*, their thoughts on music can and do, as I will argue, offer us a window onto a world of musical speculation that has been little mapped by musicologists, a world that offers sometimes surprising correctives to the 'standard history' of medieval music theory as viewed from the standpoint of the 'technical tradition.'

The twelfth-century cosmologists – that is to say, scholars interested in nature and natural processes – developed and articulated their doctrines in dialogue with Platonic and Neoplatonic texts,

[6] Lawrence Gushee, "Questions of Genre in Medieval Treatises on Music," in *Gattungen der Musik in Einzeldarstellungen: Gedenkschrift Leo Schrade*, ed. Wulf Arlt, Ernst Lichtenhahn, and Hans Oesch (Munich: Francke Verlag, 1973), 410.

[7] ibid., 423.

primarily by way of commentary on Plato's *Timaeus* (via Calcidius' translation and commentary), Macrobius' *Commentarii in Somnium Scipionis*, Martianus' *De nuptiis*, and Boethius' *Consolatio philosophiae*. These were the four late-ancient texts that offered related yet distinct points of entry into a single, overarching fascination with the *arcana naturae*. Plato's dictum, in *Timaeus* 28a, that 'nothing can come to be without a cause,' was silently elaborated by his fourth-century Latin translator, Calcidius, who expanded this foundational principle to read: 'nothing can come into being, whose rise is not preceded by a lawful cause and reason (*legitima causa et ratio*).'[8] This claim, as Andreas Speer has taught us, became the central leitmotif of twelfth-century natural philosophy.[9] For in twelfth-century talk of the creation and governance of the world, the questions 'Who?' and 'How?' were sharply differentiated: the first inquired after matters of God and faith — the province of theology; the second issued forth a new theoretical view of nature and the natural world — this was the province of the developing 'scientia naturalis.'[10] To conflate these questions and subsume the mechanisms of the 'How?' under the omnipotence of the 'Who?' was to take the easy path, 'to believe like peasants,' as William of Conches complained;[11] to painstakingly track down and account for the causes and effects at work in the natural world demanded 'a little more sweat.'[12] To be sure, the cosmologists did not see their task as antithetical to theology (however vehemently the theologians might have and did disagree with them); for they were, after all, merely entering the Divine Mansion through the side door and rummaging through the garage to find the hidden screws and nails (Calcidius' *invisibiles gomphi*, *Tim*. 43a) with which it was constructed.

The stark simplicity of the creation story in Genesis, the obvious starting point for such an

[8] *Tim*. 28a5–6: *παντὶ γὰρ ἀδύνατον χωρὶς αἰτίου γένεσιν σχεῖν*. *Translatio Calcidii* (20.21–22): Nihil enim fit, cuius ortum non legitima causa et ratio praecedat.'

[9] Andreas Speer, *Die entdeckte Natur. Untersuchungen zu Begründungsversuchen einer 'scientia naturalis' im 12. Jahrhundert* (Leiden: Brill, 1995), e.g., 290: Die Suche nach der 'legitima causa et ratio' wird zum Programm einer 'philosophia mundi'…'.

[10] M.-D. Chenu, "Découverte de la nature et philosophie de l'homme à l'Ecole de Chartres au XIIe siècle," *Cahiers d'histoire mondiale* 2 (1954): 313–325; Tullio Gregory, "L'idea della natura nella scuola di Chartres," *Giornale critico della filosofia italiano* 4 (1952): 433–442; Tullio Gregory, *Anima mundi. La filosofia di Guglielmo di Conches e la scuola di Chartres*, Pubblicazioni dell'Istituto di Filosofia dell'Università di Roma 3 (Florence: Sansoni, 1955), 175–246; Speer, *Die entdeckte Natur. Untersuchungen zu Begründungsversuchen einer 'scientia naturalis' im 12. Jahrhundert*; Andreas Speer, "The Discovery of Nature: The Contributions of the Chartrians to Twelfth-Century Attempts to Found a *scientia naturalis*," *Traditio* 52 (1997): 135–151.

[11] …'credere ut rusticos,' this being William of Conches' cranky reply to his critics. See *Phil.* 1.23 (56B): Sed quoniam ipsi nesciunt uires naturae, ut ignorantiae suae omnes socios habeant, nolunt eos aliquid inquirire, sed ut rusticos nos credere nec rationem quaerere […]. Nos autem dicimus, in omnibus rationem esse quaerendam.

[12] To cite Chenu's paraphrase of William of Conches' rallying cry, *Phil.* 2.praef. (57B): soli ueritati insudabimus. M.-D. Chenu, *Nature, Man, and Society in the Twelfth Century: Essays on New Theological Perspectives in the Latin West*, trans. Jerome Taylor and Lester K. Little (Chicago: University of Chicago Press, 1968), 12.

inquiry, was altogether too simplistic; the biblical account offered a narrative blueprint for creation, but it was too imprecise in its handling of the particulars. Instead, the cosmologists found in the *Timaeus* the more nuts-and-bolts approach they sought, and Calcidius' commentary offered a more precise handle on nature's role in the 'How?' of the world. In chapter 23, Calcidius drew a clear distinction between the works of God, the works of nature, and the works of man imitating nature.[13] It was this crucial distinction that allowed twelfth-century authorities to establish a new foothold in the ancient debate about nature: they reconfigured *natura* as the efficient cause of material creation. God alone performed the original creative act (*prima creatio*) and remained the final link in the chain of efficient causes, but after the creation *ex nihilo*, the active, sustaining force of *natura operans* took over and followed a customary course (*consuetum cursum naturae*) that could be traced through a sequence of rational causes. These natural relations, structures, and causes became, then, the proper objects of a philosophy of nature.

The cosmologists, moreover, share one fundamental assumption about these natural relations – an assumption that gave rise across the century to discussions of matters musical: nature seeks harmony. Hisdosus finds the primary expression of this natural harmony in Plato's world soul, for the *anima mundi* is a manifestation of 'the creator's eternal love, by which he created all and harmoniously rules his creation with a concord that cannot cease without immediately dissolving the *machina mundi*.'[14] William of Conches is more succinct: 'The world loves concord. And if the elements were to become discordant, the world would also dissolve.'[15] In this way, the principles of *concordia* and *proportio* became the unspoken formal cause of the mathematical aesthetics of material creation. This theme finds poetic articulation in Bernard Silvestris' *Cosmographia* through *Natura*'s intervention on behalf of *Silva*, or primordial matter, who is first characterized in Bernard's opening words as *congeries informis*. *Natura* pleads on *Silva*'s behalf: *et a ueteri cupiens exire tumultu / Artifices numeros et musica uincla requirit*.[16]

Although this overarching theme remains remarkably consistent from, say, Bernard of Chartres

[13] *In Tim.* 23 (10–12): Omnia enim quae sunt uel dei opera sunt uel naturae uel naturam imitantis hominis artificis.
[14] Paris, BnF, lat. 8624, f. 17r: Anima igitur mundi est ille creatoris amor aeternus quo cuncta creauit et creata concorditer regit ea concordia quae, si deficiat, statim mundi machinam dissoluat.
[15] *Guillelmi Glos. sup. Tim.* 39.23–25: Sed mundus diligit concordiam. Et, si fieret discordia elementorum, dissolueretur et mundus.
[16] *Cos.* Megacosmos 1.21–22.

(who deems the arithmetic, geometric, and harmonic proportions the *gradus philosophiae*)[17] all the way through to Alan de Lille's *Anticlaudianus* (where *Concordia* appears as the first of Nature's sisters and counselors),[18] I do not at all wish to imply that the various scholars and poets who maintained and adapted the tradition of speculative harmonic theory are all themselves concordant. Far from it, in fact. For they present an often dissonant plurality of voices that utilize different harmonic theories to very different ends, depending on whether the primary concern be mathematical, cosmological, ethical, or metaphysical. Mapping the various trajectories of twelfth-century sonorous, anthropological, and cosmic harmonies and their late-ancient sources is the primary goal of this study. It is my argument that (speculative) music theory not only allowed twelfth-century thinkers to conceptualize the fabric of the universe, but it also provided a hermeneutic tool for interpreting the ancient and late-ancient texts that offered detailed theories of the world's construction. The twin goals of the study are philosophical and musicological: firstly and philosophically, to analyze and reassert the importance of musical speculation in the writings of the self-styled *physici*, who probed the physical world and its metaphysical foundations during the 'Twelfth-Century Renaissance'; secondly and musicologically, to document the sources and influence of this musical speculation and to situate it within the larger tradition of 'speculative music theory.' As a means of organizing the wide-ranging collection of commentaries and treatises, I employ – purely as a heuristic device – the classic Boethian framework: *musica instrumentalis*, *musica humana*, and *musica mundana*.

The first chapter is more prolegomena than introduction. It seeks to disentangle the knotty question of sources for and connections between the late-ancient Latin background for twelfth-century Platonism(s), specifically the works of Calcidius, Macrobius, Martianus, and Boethius. Therein, as a case study through which to explore this larger theme, I trace one thread in particular, the tension between interval and ratio, that productively reveals the tension between two competing conceptions of musical relations in Greek thought: Pythagorean harmonics and Aristoxenian empiricism. The manner in which these two different approaches to musical speculation play out within the commentary tradition on Plato's *Timaeus* offers a rough and ready means of teasing out the various threads of influence among and between the Greek and Latin responses to Plato's cosmological myth. The second chapter brings the first part of the thesis to a close by defining the domain of musical

[17] *Bernardi Glos. sup. Tim.* 8.444–448: DEMONSTRARI CONVENIT NOVO GENERE, scilicet per quasdam proportiones arithmeticas, geometricas, armonicas, qui sunt gradus philosophiae.

[18] *Anticl.* 1.33: Pacis alumpna mouet primos Concordia gressus [. . .]

thought, tracing the expansion of music's role in quadrivial and natural-philosophical contexts from late-ancient encyclopedism though various twelfth-century *divisiones scientiae*.

The second part of the thesis, chapters three through five, assembles and analyzes the direct evidence for twelfth-century harmonic theory. These chapters, heuristically organized around the Boethian tripartition of music, present an anagogic ascent *per aspera ad astra*. Chapter three, the most directly 'musicological' of the three chapters, examines (under the banner of *musica instrumentalis*) evidence for practical, technical music theory as it appears in cosmological contexts and focuses on the epistemological foundations of hearing and the ontological status granted to the sonorous 'objects' of hearing. Chapter four (*musica humana*) targets the anthropological, psychological, and ethical implications of musical relations in and between body and soul. Finally, chapter five (*musica mundana*) outlines the cosmological framework, the *anima mundi* in particular, that underpins the concordant machinations of the *machina mundi* in all its manifestations: elemental harmony, the *temperies anni*, and the *musica caelestis*.

CHAPTER ONE

PROLEGOMENA: PLATONIC MUSICOLOGY IN LATE-ANCIENT THOUGHT

> There is a universal poetry that is reflected in everything. This remark approaches the idea of Baudelaire that there exists an unascertained and fundamental aesthetic, or order, of which poetry and painting are manifestations, but of which, for that matter, sculpture or music or any other aesthetic realization would equally be a manifestation. Generalizations as expansive as these: that there is a universal poetry that is reflected in everything or that there may be a fundamental aesthetic of which poetry and painting are related but dissimilar manifestations, are speculative. One is better satisfied by particulars.
>
> 'The Relations between Poetry and Painting'
>
> WALLACE STEVENS

The twelfth-century cosmologists who form the heart of this study developed and articulated their doctrines in dialogue with Platonic and Neoplatonic texts, primarily by way of commentary on Plato (via Calcidius' translation and commentary), Macrobius, Martianus, and Boethius. Contemporary scholarship has generally examined these commentary traditions individually on a diachronic axis. While this sort of inquiry usefully highlights the seams and joints in the *Rezeptionsgeschichte* of a single text, it nevertheless obscures the profoundly synchronic relationship among these four texts in the twelfth century. The works of Plato and his late-ancient proponents were not approached as autonomous, self-contained tracts; rather, they were seen to complement each other in fundamental ways. The *Timaeus* and Caldicius' *Commentary* provided a basic cosmological framework and the three metaphysical *principia*: God, Ideas (or Exemplars), and the 'Receptacle,' which was unquestioningly conflated with Aristotelian ὕλη (Latin *yle* or *silva*); Macrobius equipped them with a hermeneutic model of fables and metaphors (which coalesced into the language of *integumentum* and *involucrum*) through which they could harmonize classical myth and philosophy with Christian theology; Martianus afforded a sweeping allegorical structure for such an inquiry; and finally Boethius provided the moral end, the ascent to the *summum bonum*, that was, in a manner of speaking, the final cause of all cosmological inquiry: the ascent *per creaturas ad creatorem*.

Most importantly, all these late-ancient texts contain (often substantial) musicological discussions, which were (and often still are) read as mutually illuminating. The twelfth-century application of this musical language to cosmological and philosophical questions is the primary focus of this study. The well-documented interplay and overlap of these texts in the twelfth century raises an important question that must be dealt with first: how do these late-ancient texts *per se* relate to each other? Were their twelfth-century readers justified in explaining Calcidius with reference to Macrobius, Boethius with Calcidius, or Macrobius with Boethius? In other words, can we see beyond the generalization of their shared commitment to 'cosmic harmony' and a vaguely 'Pythagorean cosmology'? Can we satisfy Wallace Stevens' call for particulars? To answer this question, and thus to understand better the overlapping reception of these texts in the twelfth century, we must examine in some detail the relationships among these texts in the late-ancient world.

I leave aside in this chapter the peculiar case of Martianus Capella, who stands somewhat apart from Calcidius, Macrobius, and Boethius. The final book of his encyclopedic *De nuptiis Philologiae et Mercurii* is, by and large, a translation of Aristides Quintilianus' *De musica*; but this last of Martianus' nine books had largely fallen to the wayside by the time of the twelfth-century commentary tradition, which focused almost exclusively on the opening allegory in books one and two.[1] Martianus' allegorical 'frame-story' does not develop any explicit harmonic theory aside from the cosmological concord implied in the opening hymn to Hymenaeus (1.1) and the musically resonant Apollonian grove at 1.11–13, both of which will be dealt with in later chapters.

1.1 A Platonic triptych

The confluence of music theory and philosophy in the Latin sources of late-ancient Platonism is striking. But the waters in which these cross-currents converge remain dark and murky, for they swiftly recede into the early Greek commentary tradition on Plato, a tradition in which we have more names than surviving texts, and more doxographic reports than we have names. This is nowhere more evident (or rather, more obscure) than in the flood of commentary that arose in response to

[1] On the manuscript tradition and reception history of Martianus' *De nuptiis*, see Claudio Leonardi, "I codici di Marziano," *Aevum* 33 (1959–1960): 443–89 and 34: 1–99, 411–524, Jean Préaux, "Les manuscrits principaux du *De nuptiis Philologiae et Mercurii* de Martianus Capella," in *Lettres latines du moyen-âge et de la renaissance*, ed. Guy Cambier, Carl Deroux, and Jean Préaux, Collection Latomus 158 (Brussels: Latomus, 1978), 76–128, and Mariken Teeuwen, *Harmony and the Music of the Spheres: The ars musica in Ninth-Century Commentaries on Martianus Capella*, Mittellateinische Studien und Texte 30 (Leiden: Brill, 2002).

one of the most famous and abstruse passages of Platonic philosophy, the division of the world soul in the *Timaeus*. On this point, Calcidius, Macrobius, and Boethius form for us a unique triptych, and this for at least three reasons, none of which is without contention.

First and most trivially, their historical positioning offers us three snapshots of Platonism, each separated by approximately a century: circa 325 (Calcidius), circa 430 (Macrobius), and circa 510–525 (Boethius). To say this is already to stake a claim in the long debate about the dates of Calcidius and Macrobius. Hence, I would plump for the early dating of Calcidius' translation and commentary (the first quarter of the fourth century),[2] and I find compelling Alan Cameron's arguments for the later dating of Macrobius' *Commentarii in Somnium Scipionis* (around 430).[3] Second, each Latin author is similar to the others in his reliance upon Greek sources and active engagement with the Greek philosophical tradition. This observation, too, is in itself trivial, for there the similarity ends and argument begins; just what Greek texts and traditions were in play for each author is precisely what is at stake. Third, and most contentiously, each had independent access to the text of the *Timaeus*: that is to say, Calcidius did not know Cicero's translation; Macrobius did not know Calcidius' version and seems not to have known Cicero's either; and Boethius certainly knew Cicero's translation, but his knowledge of Calcidius' remains an open question, for there is no single doctrinal or terminological point that necessitates Boethius' direct engagement with Calcidius.[4] I will take up this last point in more detail later.

These three authors witness, independently, different phases of the Timaean commentary tradition, which can be summarized as follows. Calcidius largely (but not exclusively) adheres to the Middle Platonic commentary tradition,[5] and his exegesis of the harmonious *anima mundi* is drawn from the Neopythagorean Numenius (on the soul's substance)[6] and Adrastus the Peripatetic (on

[2] against Waszink, *Timaeus a Calcidio translatus*, xiii–xv, following Courcelle 1973; arguments against Waszink include, John Dillon, *The Middle Platonists: 80 B.C. to A.D. 220*, revised edition (Ithaca and New York: Cornell University Press, 1996), 401–402.

[3] Alan Cameron, "The Date and Identity of Macrobius," *Journal of Roman Studies* 56 (1966): 25–38.

[4] Boethius also knew Macrobius, as Courcelle persuasively demonstrates (Pierre Courcelle, *Late Latin Writers and their Greek Sources*, trans. Harry E. Wedeck [Cambridge, MA: Harvard University Press, 1969], 298–300), but his use of Macrobius, I think, is fueled by a similar 'nostalgia' that Boethius saw in his fellow fifth-century Roman; Macrobius is not an important source of Neoplatonic philosophy, or more specifically, harmonic theory for Boethius. As Courcelle points out (300), if Boethius does call on Macrobius for philosophical points, he 'moderniz[es] and adapt[s] him to the more recent Platonic theories.'

[5] I use the term Middle Platonic advisedly. Calcidius' commentary in many ways highlights the problems inherent in assigning texts to either a Middle Platonic or Neoplatonic framework: Calcidius' commentary spans both and is thus both and neither simultaneously.

[6] On the Numenian material in Calcidius see John Phillips, "Numenian Psychology in Calcidius?" *Phronesis* 48 (2003): 132–151.

the soul's division). Later passages in Calcidius suggest that he did in fact have access to some Porphyry, but this access does not include Porphyry's (now lost) *Commentary on the Timaeus*. This point is in direct contrast to Macrobius, who draws heavily on Porphyry's Timaean exegesis of the *anima mundi*, so much so that his commentary on the *Somnium Scipionis* verges on a commentary on the *Timaeus*.[7] Finally, Boethius knew the *Timaeus* and the Timaean commentary tradition not through any Latin intermediaries but through Greek sources. Through their influence (primarily Nicomachus of Gerasa), his early quadrivial works retain arguments that are still (in a sixth-century Latin work) redolent of their origin in the early Greek Timaean commentary traditions (as I will argue in detail later). In Boethius' later works, primarily the famous summary of Timaean cosmology and metaphysics at *Consolatio philosophae* 3.m9, he is clearly indebted to the later Neoplatonic commentators (above all, Porphyry and Proclus), but his poetic language remains too diffuse to allow the easy identification of his immediate sources.

What has not been sufficiently emphasized – at least not in musicological circles – is that the harmonic tradition witnessed in all three of these Latin authors arose from specifically Timaean concerns. The genesis of the *anima mundi* occasioned the internal generation of what I would call 'Timaean' musical speculation, a musical speculation closely attuned to the (mathematical) music theory useful for reading Plato (to tweak the title of Theon of Smryna's contribution).[8] In this chapter, I examine the arithmetic, geometric, and harmonic implications of the *anima mundi* within these three texts. The focal point of the argument is a rather mundane little point, prompted by a discussion in Andrew Barker's 'Early Timaeus Commentaries and Hellenistic Musicology': the conceptual tension between numerical ratio (λόγος) and geometrical interval (διάστημα).[9] This tension productively aligns with and highlights various philosophical affiliations. Music theory thus offers another way to assess the complex web of connections among and distinctions between these important Platonic texts.

[7] See, for instance, Courcelle, *Late Latin Writers*, 44.

[8] Hiller, *Theonis Smyrnaei philosophi Platonici Expositio rerum mathematicarum ad legendum Platonem utilium*; French translation by J. Depuis, trans., *Théon de Smyrne philosophe platonicien: exposition des connaissances mathématiquesutiles pour la lecture de Platon* (Paris: Hachette, 1892). The new annotated translation by Joëlle Delattre-Biencourt – *Théon de Smyrne. Lire Platon. Le recours au savoir scientifique: arithmétique, musique, astronomie* (Toulouse: Anacharsis, 2010) – came to my notice too late to be used here.

[9] Andrew Barker, "Early *Timaeus* Commentaries and Hellenistic Musicology," in *Ancient Approaches to Plato's Timaeus*, ed. Robert W. Sharples and Anne Sheppard, Bulletin of the Institute of Classical Studies 78 (London: Institute of Classical Studies, University of London, 2003), 73–87.

1.2 Timaean harmonic theory

According to *Timaeus* 47d, the movements of *harmonia*, glossed as *modulatio* by Calcidius, are akin to the revolutions of the soul within us. Thus *harmonia* 'is given by the Muses as an ally to the soul in bringing its revolution in us, which has been knocked out of tune, into order and concord with itself.' 'Knocked out of tune' here is my colloquial rendering of *ἀνάρμοστος*, the same term used in 80a to describe the motion of discordant musical notes (*ἀνάρμοστοι φθόγγοι*). The soul is knocked out of tune when it is bound to that 'mighty river'(*ποταμὸς πολύς*), the flow of sensation (*αἴσθησις*) described in 43a–44a. Hence, Plato seems at times to suggest that the harmonious choreography of the movements of the world soul can be revealed to the out-of-tune human soul through the conduit of 'music,' understood in its narrow and corporeal sense, insofar as 'music' is a reflection of the same intelligible harmony: a distant mirror of the silent *harmonia*—the macrocosmic harmonies that ensure cosmological perfection and the microcosmic harmonies that govern the moral and physical equilibrium of the body.

In his study 'Timaeus on Music and the Liver,' Andrew Barker takes up this line of argument and considers in detail the question of how music can impinge upon the soul and thus play a therapeutic role in its re-harmonization.[10] His ingenious, speculative account, however, requires an integral and internally consistent reading of the full Timaean dialogue, as he draws deductive connections between 47d, the account of sound and hearing at 67ac, the description of consonance at 80ab, and finally the physiological account of the liver in 70d–72b. By reading these passages in tandem, Barker argues that music impinges on the soul not through the detached contemplation of mathematical theorems, but through what he calls the 'imagistic' experience of sounding music in the lower part of the soul (which is closely connected to the liver); this 'imagistic' experience then circulates (in circular motion) back into an 'intelligent' experience in the mind.[11] While Barker's speculation might have much to recommend it as an ingenious modern interpretation of Plato, it can have little bearing, I think, on ancient accounts. Granted, speculative ingenuity is par for the course among the ancient commentators, but I know of no extant ancient (or late-ancient) work that offers us a systematic and internally consistent reading of the *Timaeus* in its totality. To the contrary, the

[10] Andrew Barker, "Timaeus on Music and the Liver," in *Reason and Necessity: Essays on Plato's Timaeus*, ed. M.R. Wright (London: Duckworth and the Classical Press of Wales, 2000), 86–99.

[11] ibid., 97.

Timaeus was very often digested in bits (necessitated perhaps by the very commentary format) and often picked over for either its psychology (Plutarch)[12] or its physiology (Galen),[13] but never, to my knowledge, from start to finish: even Proclus' commentary, the most extensive of the extant commentaries, only survives through 44d (though a fragment of Proclus' comments on 89e–90c preserved by Hunayn ibn Ishāq suggests that the commentary was more extensive than the extant text would suggest).[14] Even Calcidius finds little occasion to cite later passages in the *Timaeus* in the course of his comments on 17c–53c, even though it was clearly his intent to translate and comment upon the full text. Hence, Barker's deductive speculations as to how music impinges on the soul would not have been a viable interpretive strand within the ancient commentary tradition. Moreover, the commentators were generally agreed that the *μουσική* of the *Timaeus* was not synonymous with 'sounding music.' Consider, for instance, Theon of Smyrna, who tells us (with reference to *Republic* 531ab) that:[15]

> we have no need for a musical instrument, as Plato himself explains, when he says that it is not necessary to pluck the strings of an instrument, with attentive ears like curious eavesdroppers. For we seek to understand the harmony in the cosmos and the music within it; we can only examine this harmony after having studied the numerical laws of sounds.

Within the commentary tradition, the connection between the harmony of the world soul and the harmony of individual souls was sought not through the impingement of 'sounding music' on the soul, but through the rational contemplation of the *νοητὴ ἁρμονία*, the intelligible harmonia revealed through number.[16] And thus my discussion of Timaean musicology will not address how its music-theoretical system might relate to actual systems of applied musicology, but only the intelligible harmony of the world soul.

[12] Harold Cherniss, ed. and trans., *De animae procreatione in Timaeo*, vol. 13.1 of *Plutarch: Moralia* (Cambridge, MA: Harvard University Press, 1976) *De animae procreatione in Timaeo*.

[13] Carlos J. Larrain, ed., *Galens Kommentar zu Platons Timaios*, Beiträge zur Altertumskunde 29 (Stuttgart: Teubner, 1992).

[14] Harold Tarrant et al., trans., *Proclus: Commentary on Plato's Timaeus*, 4 vols. (Cambridge: Cambridge University Press, 2006–2009). The introduction to the first volume, *Book I: Proclus on the Socratic State and Atlantis*, has a summary overview of the full extant commentary (13–20: 'Formal features of Proclus' commentary' and 'The *skopos* of the *Timaeus*: theology and physiology').

[15] *Exp.* 16.26–17.5: *τῆς μὲν γὰρ ἐν ὀργάνοις οὐ παντάπασι προσδεόμεθα, καθὰ καὶ αὐτὸς ὁ Πλάτων ἀφηγεῖται λέγων ὡς οὐ χρὴ ὥσπερ ἐκ γειτόνων φωνὴν θηρευομένους πράγματα παρέχειν ταῖς χορδαῖς· ὀρεγόμεθα δὲ τὴν ἐν κόσμῳ ἁρμονίαν καὶ τὴν ἐν τούτῳ μουσικὴν κατανοῆσαι· ταύτην δὲ οὐχ οἷόν τε κατιδεῖν μὴ τῆσ ἐν ἀριθμοῖς πρότερον θεωρητικοὺς γενομένους.*

[16] Though not all commentators were so resolute in their dismissal of instruments and consideration of 'sounding music.' The now lost commentary on the *Timaeus* by Aelianus, of which fragments are preserved in Porphyry's *Commentary on Ptolemy's Harmonics*, includes *inter alia* a discussion of the aulos (a comparison of Phrygian auloi to Greek auloi) used to illustrate the production of high and low sounds. See *In Ptolemei Harm.* 34.11–21.

Timaeus describes the *psychogonia*, as Calcidius deemed it, in language 'commonly associated with metalworking techniques,' as Sergio Zedda has rightly stressed.[17] After forging the initial mixture from the Same, the Different, and Substance (which will not concern us here), the Demiurge proceeds to divide it in accordance with the following harmonic structure:[18]

> This is how he began to divide. First he took away one part from the whole, then another, double the size of the first, then a third, one and a half times the second and three times the first, then a fourth, double the second, then a fifth, three times the third, then a sixth, eight times the first, then a seventh, twenty-seven times the first. Next he filled out the double and triple intervals, once again cutting off parts from the material and placing them in the intervening gaps, so that in each interval there were two means, the one [the harmonic mean] exceeding and exceeded by the same part of the extremes themselves, the other [the arithmetic mean] exceeding and exceeded by an equal number. The hemiolic, epitritic and epodgoic spaces arose from these links within the previous spaces; and he filled up all the epitritics with the epogdoic kind of interval, leaving a part of each of them, where the space of the remaining part had as its boundaries, number to number, 256:243 (35b4–36b3).

There are several musicological problems, noted by commentators ancient and modern, which will not detain us here. For the gaps in his account are not insurmountable, and commentators were quick to intervene in various ways. As Andrew Barker notes, Plato does not set himself to the 'task of making his construction correspond at every point to the shape of a system that could be used in practice. [...] There are no notes or pitches in his *harmonia*; there are only numbers.'[19] But this is not quite the whole truth, for there are more than just numbers, that is, discrete quantities: there are also parts (*μοῖραι*) as well as intervals or spaces (*διαστήματα*), that is, continuous magnitudes. In fact, it could be argued that there are no discrete numbers at all, just magnitudes related by numerical ratios. This will prove significant.

[17] Sergio Zedda, "How to Build a World Soul: a Practical Guide," in *Reason and Necessity: Essays on Plato's* Timaeus, ed. M.R. Wright (London: Duckworth and the Classical Press of Wales, 2000), 23–41: 'The most obvious linguistic reference in the passage 35a1–b4, describing the construction of the world soul, is to the craft of metalworking. [...] Similarly, the passage at 41d4–7, describing the construction of the human soul, is based on a type of language more commonly associated with metalworking techniques than with metaphysics' (25).

[18] *Tim.* 35b4–36b3: *ἤρχετο δὲ διαιρεῖν ὧδε. μίαν ἀφεῖλεν τὸ πρῶτον ἀπὸ παντὸς μοῖραν, μετὰ δὲ ταύτην ἀφῄρει διπλασίαν ταύτης, τὴν δ' αὖ τρίτην ἡμιολίαν μὲν τῆς δευτέρας, τριπλασίαν δὲ τῆς πρώτης, τετάρτην δὲ τῆς δευτέρας διπλῆν, πέμπτην δὲ τριπλῆν τῆς τρίτης, τὴν δ' ἕκτην τῆς πρώτης ὀκταπλασίαν, ἑβδόμην δ' ἑπτακαιεικοσιπλασίαν τῆς πρώτης. μετὰ δὲ ταῦτα συνεπληροῦτο τά τε διπλάσια καὶ τριπλάσια διαστήματα, μοίρας ἔτι ἐκεῖθεν ἀποτέμνων καὶ τιθεὶς εἰς τὸ μεταξὺ τούτων, ὥστε ἐν ἑκάστῳ διαστήματι δύο εἶναι μεσότητας, τὴν μὲν ταὐτῷ μέρει τῶν ἄκρων αὐτῶν ὑπερέχουσαν καὶ ὑπερεχομένην, τὴν δὲ ἴσῳ μὲν κατ' ἀριθμὸν ὑπερέχουσαν, ἴσῳ δὲ ὑπερεχομένην. ἡμιολίων δὲ διαστάσεων καὶ ἐπιτρίτων καὶ ἐπογδόων γενομένων ἐκ τούτων τῶν δεσμῶν ἐν ταῖς πρόσθεν διαστάσεσιν, τῷ τοῦ ἐπογδόου διαστήματι τὰ ἐπίτριτα πάντα συνεπληροῦτο, λείπων αὐτῶν ἑκάστου μόριον, τῆς τοῦ μορίου ταύτης διαστάσεως λειφθείσης ἀριθμοῦ πρὸς ἀριθμὸν ἐχούσης τοὺς ὅρους ἓξ καὶ πεντήκοντα καὶ διακοσίων πρὸς τρία καὶ τετταράκοντα καὶ διακόσια.* I follow the translation, with minor modifications, of Andrew Barker, *The Science of Harmonics in Classical Greece* (Cambridge: Cambridge University Press, 2007), 319.

[19] ibid., 322.

Similar language appears at 43de, where Plato describes how individual souls, although constructed in accord with the world soul, are knocked out of tune:[20]

> The double and triple distances, three of each, and the hemiolic, epitritic and epogdoic means and linkages, while they cannot be totally destroyed except by the agent who bound them together, bend into twisted shapes of all sorts, and inflict every kind of breakage and ruin on the circles, so far as that is possible, so that they scarcely hold together, and move, but move irrationally, sometimes forwards, sometimes sideways, sometimes upside down (43d4–e4).

What is important for my purposes is to highlight the terminological tension that arises in these passages between the use of terms that denote mean or proportional linkage (*μεσότης*, *σύνδεσις*) and terms that denote interval or space (*διάστημα*, *διάστασις* and *ἀπόστασις*). Strikingly, spatial terms appear where we would expect Plato to use *λόγος*, 'ratio,' a term not used at all in these passages – for it is spaces that are in both passages deemed duple, triple, hemiolic, epitritic, and epogdoic.[21]

Of course, *διάστημα* does not necessarily have the musical meaning of 'interval' here, for the term's primary signification is geometrical, where it means simply the distance between geometrical points, lines, surfaces, etc., and this is how the term is used, for instance, by Archimedes.[22] On this point, it is worth recalling that Aristotle (at *De anima* 407a) had criticized Plato for presenting the soul as a spatial magnitude (*μέγεθος*).[23] Perhaps as early as the Old Academy, with Speusippus, there arose a debate that likely sprung from the *Timaeus* about whether or not the soul, the world soul in particular, is a 'geometrical magnitude.'[24] In addition to Aristotle's criticism, we have the report of Iamblichus, who, at the beginning of his own *De anima*, gives us a doxographical history of his predecessors' beliefs. There were, he writes, three kinds of mathematical conceptions of the soul: the geometrical, arithmetical and the harmonic. To the first category he assigns both Speusippus and Severus.[25] Iamblichus' claim on Severus has independent confirmation via Proclus who also criticizes

[20] *Tim.* 43d4–e4: *ὥστε τὰς τοῦ διπλασίου καὶ τριπλασίου τρεῖς ἑκατέρας ἀποστάσεις καὶ τὰς τῶν ἡμιολίων καὶ ἐπιτρίτων καὶ ἐπογδόων μεσότητας καὶ συνδέσεις, ἐπειδὴ παντελῶς λυταὶ οὐκ ἦσαν πλὴν ὑπὸ τοῦ συνδήσαντος, πάσας μὲν στρέψαι στροφάς, πάσας δὲ κλάσεις καὶ διαφθορὰς τῶν κύκλων ἐμποιεῖν, ὅσαχῇπερ ἦν δυνατόν, ὥστε μετ' ἀλλήλων μόγις συνεχομένας φέρεσθαι μέν, ἀλόγως δὲ φέρεσθαι, τοτὲ μὲν ἀντίας, ἄλλοτε δὲ πλαγίας, τοτὲ δὲ ὑπτίας.* Trans. Barker (with modifications), Barker, *The Science of Harmonics*, 323.

[21] Barker makes the point briefly in "Early *Timaeus* Commentaries," 83.

[22] See Nathan Sidoli, "On the Use of the Term *Diastema* in Ancient Greek Constructions," *Historia Mathematica* 31 (2004): 2–10.

[23] 407a2: *πρῶτον μὲν οὖν οὐ καλῶς τὸ λέγειν τὴν ψυχὴν μέγεθος εἶναι·*

[24] On which see Leonardo Tarán, *Speusippus of Athens. A Critical Study with a Collection of the Related Texts and Commentary*, Philosophia antiqua 39 (Leiden: Brill, 1981), 367–370; cf. Dillon, *The Middle Platonists*, 263–264.

[25] John F. Finamore and John M. Dillon, *Iamblichus* De anima*: Text, Translation, and Commentary*, Philosophia antiqua 92 (Leiden: Brill, 2002), 28–29 (§4), commentary at 79–85; cf. Tarán, *Speusippus of Athens*, 154 (F54ab), commentary at 365–371.

Severus for holding the position that the soul is a 'geometrical hypostasis' compounded from indivisible substance (the point) and divisible substance (extension, διάστασις).[26] There is debate between Dillon and Tarán whether or not the Old Academic Speusippus actually held the position that the world soul is a geometrical magnitude, but that in and of itself is immaterial for my purposes, and we can leave it aside. It is enough to note that there was a tradition that posited the world soul as a quasi-geometrical entity.

1.3 Pythagorean and Aristoxenian harmonic theory

To make sense of the musical implications of the term διάστημα and its tension with the unspoken λόγος that hovers in the background of this passage, it will be useful to summarize most briefly the two very different conceptions of musical construction in Greek antiquity that reflect the basic theoretical approaches of the two primary 'schools' of Greek Harmonics, the Pythagorean and the Aristoxenian.[27] Pythagorean harmonics championed the thesis that musical relations are fundamentally quantitative, and thus pitch relations (e.g., the octave, the fifth, and the fourth) are reducible to numerical ratios (2 : 1, 3 : 2, and 4 : 3 respectively). Because of the primacy of ratio, it is tricky to speak (in any quantitative sense) of intervals or διαστήματα in a strictly Pythagorean context; the interval of, for example, the minor semitone, expressed by the ratio 256 : 243 is not, or at least not in any meaningful way, reducible to the distance or difference between the terms in its simplest numerical expression (i.e., the interval of the semitone is not 13, the numerical 'distance' between 256 and 243).

This Pythagorean position finds expression, though not without a healthy measure of critique, in Plato's dialogues. 'Concordance' (συμφωνία) as described in *Republic* 531c, for instance, is almost exclusively a property of numerical relations, which pertain to audible sounds only insofar as they are the phenomenological manifestation of numerical ratio (and Plato, at 531a1–3, takes οἱ Πυθαγόρειοι to task for being too concerned with the audible realm – though Ptolemy will criticize them for the opposite). Thus, musical relations are concordant provided their ratios can be accounted for by mathematically demonstrable principles – that is, 'which numbers are inherently concordant and

[26] *In Platonis Timaeum commentarii* 2.153.

[27] The best introduction (which goes well beyond introduction) is now Barker, *The Science of Harmonics*; for a concise summary, see Barker, "Early *Timaeus* Commentaries," 73–75.

which not and why in each case' (*τίνες σύμφωνοι ἀριθμοὶ καὶ τίνες οὔ, καὶ διὰ τί ἑκάτεροι*). Barker's cogent summary of the limited role of sense-perception in Platonic contexts is instructive:[28]

> The aesthetic discriminations of the human ear provide no adequate test of the correctness of musical relations. Harmonics, admittedly, must begin from auditory observations, through which such concepts as concordance, attunement, and the rest are first suggested to the mind; and these must at some stage be correlated with visual observations, in operations with strings or analogous devices, in order for us to become aware of the quantitative nature of such relations. But once these points have been established, the study of relations of quantities, simply as such, is a task for the mind alone. Perception has done its job, and has no further part to play.

Intervals, by contrast, find their natural expression in the Aristoxenian tradition, for Aristoxenus took as primary not numerical quantity but the sense-perceptible continuity (or discontinuity) of vocal sound, subjected to rigorous Aristotelian empiricism.[29] The singing voice produces distinct pitches on account of a constant tension (*τάσις*) that is maintained throughout the duration of a note, while speech, on the contrary, is continuously changing. The vocal motion (*κίνησις*) of speech is 'continuous' (*συνεχής*), whereas song employs an 'intervallic' (*διαστηματική*) motion that moves discretely from note to note (*φθόγγος*), each a single 'incidence of the voice on one tension/pitch' (*φωνῆς πτῶσις ἐπὶ μίαν τάσιν*).[30] With these fundamental principles of melody in place, Aristoxenus proceeds to define a geometrical musical space. For an 'interval' (*διάστημα*), he continues, is 'what is bounded by two notes which do not have the same pitch, since an interval appears, roughly speaking, to be a certain difference between pitches and a space capable of receiving notes higher than the lower of the pitches bounding the interval, and lower than the higher of them.'[31] Here we not only can but must speak of intervals, as Aristoxenus, in line with Theophrastus and other Peripatetics,[32] claimed that numerical quantity had nothing to do with the phenomenological presentation of sound to the ears (or to the mind). To say that the tone is 9 : 8 has little bearing on the phenomenological reality

[28] Andrew Barker, *Scientific Method in Ptolemy's Harmonics* (Cambridge: Cambridge University Press, 2000), 11.

[29] See Sophie Gibson, *Aristoxenus of Tarentum and the Birth of Musicology*, Studies in Classics 9 (New York: Routledge, 2005), 23–30.

[30] All of these terms are defined and discussed in *El. har.* 8.15–9.3.

[31] *El. har.* 15.15–33: *διάστημα δ' ἐστὶ τὸ ὑπὸ δύο φθόγγων ὡρισμένον μὴ τὴν αὐτὴν τάσιν ἐχόντων. φαίνεται γάρ, ὡς τύπῳ εἰπεῖν, διαφορά τις εἶναι τάσεων τὸ διάστημα καὶ τόπος δεκτικὸς φθόγγων ὀξυτέρων μὲν τῆς βαρυτέρας τῶν ὁριζουσῶν τὸ διάστημα τάσεων, βαρυτέρων δὲ τῆς ὀξυτέρας.* I follow here Barker's translation with minimal modifications (Andrew Barker, *Greek Musical Writings: Volume II: Harmonic and Acoustic Theory*, Cambridge Readings in the Literature of Music [Cambridge: Cambridge University Press, 1989], 132).

[32] e.g., Theophrastus, *De musica* (preserved in Porphyry's *Commentary on Ptolemy's Harmonics*): *καὶ γὰρ εἰ πᾶν διάστημα πλῆθός τι, τὸ δὲ μέλος ἐκ διαφορῶν φθόγγων, τὸ μέλος ὅτι ἀριθμὸς τοιόνδε ἂν εἴη· ἀλλ' εἰ μηδὲν ἄλλο ⟨ἢ⟩ ἀριθμός, πᾶν ἀριθμητὸν μετέχοι ἂν καὶ μέλους, ὅσον καὶ ἀριθμοῦ* (*In Ptolemei Harm.* 62.7–10.

of music, and thus Aristoxenus and his adherents had no qualms dividing the tone into two, three, or four equal parts – a position impossible in Pythagorean harmonics, as the tone (9 : 8) cannot be generated by squaring (or cubing, etc.) any rational proportion.[33]

1.4 Boethius

With this philosophical and musicological background in place, we can now turn to our Platonic triptych of Calcidius, Macrobius, and Boethius to see how this conceptual tension between ratio and interval plays out, and how each leads us back, albeit by different paths, to Plato's *Timaeus*. We begin with the last of the triptych, Boethius, whose *De institutione musica* nicely frames the problem and offers a concrete example through which to structure the remainder of the argument.

Before turning to the *De institutione musica*, however, we must deal first with a more general question: was Boethius' knowledge of the *Timaeus* independent of Calcidius? The question has recently been reopened by Béatrice Bakhouche and Peter Dronke, who have both reasserted that Boethius knew Calcidius' translation and commentary (arguing against Courcelle, though not as optimistically as Sulowski).[34] There is still more to be said on the matter. For starters, Bakhouche's listing of Boethius' citations of the *Timaeus* is incomplete, and two of the omissions are significant. First, if we consider Boethius' full extant corpus, it is no longer true (as Bakhouche claims) that Boethius cites no passages of the *Timaeus* beyond the portion translated by Calcidius. For *De institutione musica* 1.30, a chapter entitled 'How Plato says consonance is made,' very closely paraphrases *Timaeus* 80ab, a passage far beyond where both Cicero and Calcidius had trailed off.[35] Admittedly, the sub-

[33] A true semitone would be $\frac{3}{2\sqrt{2}}$.

[34] Béatrice Bakhouche, "Boèce et le *Timée*," in *Boèce ou la chaîne des savoirs. Actes du Colloque international de la Fondation Singer-Polignac (Paris 8–12 juin 1999)*, ed. Alain Galonnier, Philosophes Médiévaux 44 (Louvain-la-Neuve: Peeters, 2003), 21: 'Je serais tentée de croire que Boèce a connu le Timee à travers Calcidius, comme il avait d'abord connu les Categories à travers Marius Victorinus.' Cf. Jan Sulowski, "Les sources du *De consolatione philosophiae*," *Sophia* 25 (1957): 76–85; Jan Sulowski, "The Sources of Boethius' *De consolatione philosophiae*," *Sophia* 29 (1961): 67–94; and the *fontes et similia* in Bieler's edition: *Boethii Philosophiae consolatio*, revised edition, ed. Ludwig Bieler, Corpus Christianorum. Series Latina 94.1 (Turnholt: Brepols, 1984).

[35] *καὶ ὅσοι φθόγγοι ταχεῖς τε καὶ βραδεῖς ὀξεῖς τε καὶ βαρεῖς φαίνονται* [...] *τὰς γὰρ τῶν προτέρων καὶ θαττόνων οἱ βραδύτεροι κινήσεις ἀποπανομένας ἤδη τε εἰς ὅμοιον ἐληλυθυίας, αἷς ὕπστερον αὐτοὶ προσφερόμενοι κινοῦσιν ἐκείνας, καταλαμβάνουσιν, καταλαμβάνοντες δὲ οὐκ ἄλλην ἐπεμβάλλοντες ἀνετάραξαν κίνησιν, ἀλλ' ἀρχὴν βραδυτέρας φορᾶς κατὰ τὴν τῆς θάττονος, ἀπολῃγούσης δέ, ὁμοιότητα προσάψαντες, μίαν ἐξ ὀξείας καὶ βαρείας συνεκεπάσαντο πάθην* (*Tim.* 80a3–b5). Cf. *Inst. mus.* 1.30 (221.12–20): Plato autem hoc modo fieri in aure consonantiam dicit. Necesse est, inquit, velociorem quidem esse acutiorem sonum. Hic igitur cum gravem praecesserit, in aurem celer ingreditur, offensaque extrema eiusdem corporis parte quasi pulsus iterato motu revertitur. Sed iam segnior nec ita celeri ut primo impetu emissus cucurrit, quocirca gravior quoque. Cum igitur iam gravior rediens nunc primum venienti gravi sono similis occurrit, miscetur ei unamque ut ait consonantiam miscet.

sequent chapter contrasts Plato's account with that of Nicomachus, who judged Plato's view to be wrong (*sed id Nicomachus non arbitratur veraciter dictum*), which suggests that Boethius has followed Nicomachus' own citation. Nevertheless, there is no reference to *Tim.* 80ab in the extant corpus of Nicomachus by which we could judge whether Boethius knew the passage directly or not. Second, Bakhouche makes no mention of the third book of Boethius' *In Ciceronis Topica* (PL64, 1092D), where Boethius cites the opening line of Cicero's translation, and does so with explicit attribution: *Unde etiam idem Cicero in Timeo Platonis ait: Quid est quod semper sit, nec ullum habeat ortum, et quod gignatur, nec unquam sit?*.

Peter Dronke, in his recent study of Calcidius, adduces additional support for Boethius' knowledge of Calcidius by asserting that Socrates' 'dream vision' at Crito 44a (ἐδόκει τίς μοι γυνὴ προσελθοῦσα καλή καὶ εὐειδής, λευκὰ ἱμάτια ἔχουσα, καλέσαι με καὶ εἰπεῖν), referenced obliquely by Boethius (*Cons. phil.* 1.p1.1: *adstitisse mihi supra uerticem uisa est mulier reuerendi admodum uultus*) and directly by Calcidius (*In Tim.* 254 [263.7–8]: *Visa est mihi quaedam, inquit, mulier eximia uenustate, etiam candida ueste, nomine me adpellasse dixisseque illud Homericum* …) is 'one of the most fascinating of the links between Calcidius' commentary and Boethius' testament.'[36] The link is indeed fascinating – but not for the connection it proves. Rather, it is surprising just how open the question must remain even at the seemingly strongest moments of overlap. For it is possible, even probable, that Calcidius and Boethius were working here independently, both with reference to the citation of the same passage provided in Cicero's *De divinatione* 1.25.52:[37]

> Sed, veniamus nunc, si placet, ad somnia philosophorum. Est apud Platonem Socrates, cum esset in custodia publica, dicens Critoni, suo familiari, sibi post tertium die esse moriendum; uidisse se in somnis pulchritudine eximia feminam, quae se nomine appelans diceret Homericum quendam eius modi uersum …

The points of similarity between Calcidius' and Boethius' translations (*visa est … mulier*) are too general to be conclusive, as they translate the same Greek text (ἐδόκει … γυνὴ). The points of similarity between Cicero and Calcidius – *eximia pulchritudine* and *eximia venustate* (obliquely echoed by *ad-*

[36] Peter Dronke, *The Spell of Calcidius: Platonic Concepts and Images in the Medieval West*, Millennio medievale 74 (Florence: SISMEL, Edizioni del Galluzzo, 2008), 48.

[37] This connection has been noted in John Magee, "Boethius' Anapestic Dimeters (Acatalectic) with Regard to the Structure and Argument of the *Consolatio*," in *Boèce ou la chaîne des savoirs. Actes du Colloque international de la Fondation Singer-Polignac (Paris 8-12 juin 1999)*, ed. Alain Galonnier, Philosophes Médiévaux 44 (Louvain-la-Neuve: Peeters, 2003), 149, n. 8.

modum in Boethius) – are more intriguing in that they both similarly supersede the Greek text, which simply tells us that the woman is καλή καὶ εὐειδής).

The *Consolatio philosophiae* can only offer weak, circumstantial evidence that Boethius approached the *Timaeus* through Calcidius. The *De institutione musica*, on the contrary, offers concrete and compelling examples of how traits unique to the Greek Timaean commentary tradition came to Boethius through the second-century Pythagorean, Nicomachus of Gerasa. The argument is somewhat complex and requires a detailed examination of a curious arithmetical method that Boethius employs in his *De institutione musica*.

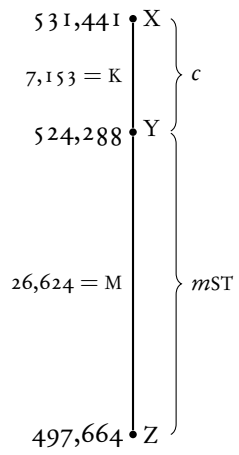
1.5 Timaean Arithmetic in Boethius' *De institutione musica*

In a 1981 article, 'Interpreting an Arithmetical Error in Boethius's *De institutione musica*, iii.14–16,' André Barbera highlighted a problematic set of arithmetical proofs that cap book three's extended argument against the Aristoxenian equal division of the tone. In book three, chapters fourteen through sixteen, Boethius mounts a *demonstratio per numeros* that (1) the minor semitone is larger than three commas but smaller than four (3.14), (2) the major semitone is larger than four commas but smaller than five (3.15), and (3) the whole tone is larger than eight commas but smaller than nine (3.16). These results are correct; however, the arithmetical procedure by which Boethius attains these faultless conclusions seems faulty at best: Barbera deems the procedure an 'arch arithmetical crime,'[38] Anja Heilmann calls it a 'methodische[r] Schnitzer,'[39] and Calvin Bower judges it a flat-out 'mistake' — an Aristoxenian mistake at that, a grievous insult to a card-carrying Pythagorean like Boethius.[40] What occasioned this sound scolding? As Barbera, Bower, and Heilmann all observe, Boethius' proof manipulates the *numerical difference* between the terms of a ratio as if it were a meaningful quantification of the resultant musical interval – that is to say, Boethius' mathematical method seemingly conflates the two competing conceptions of musical organization sketched above.

[38] André Barbera, "Interpreting an Arithmetical Error in Boethius's *De institutione musica* (iii.14-16)," *Archives internationales d'histoire des sciences* 31 (1981): 30.

[39] Anja Heilmann, *Boethius' Musiktheorie und das Quadrivium: eine Einführung in den neuplatonischen Hintergrund von "De institutione musica"*, Hypomnemata: Untersuchungen zur Antike und zu ihrem Nachleben 171 (Göttingen: Vandenhoeck & Ruprecht, 2007), 228.

[40] Calvin Bower, *Fundamentals of Music: Anicius Manlius Severinus Boethius*, ed. Claude V. Palisca, Music Theory in Translation (New Haven: Yale University Press, 1989), 110.



X:Y = 531,441:524,288 = comma (*c*)
Y:Z = 256:243 = minor semitone (*m*ST)
X − Y = 7,153 = K= difference of a comma
Y − Z = 26,624 = M= difference of a semitone
3K < M < 4K
21,459 < 26,624 < 28,612

∴ A minor semitone is larger than three commas but smaller than four.

Figure 1.1: Boethius' proof that a minor semitone (*m*ST) is larger than three commas (*c*) but smaller than four (*Inst. mus.* 3.14).

This conflation, I claim, ultimately derives from the *Timaeus*. The argument for this claim will proceed in three stages. First, I demonstrate that Boethius' arithmetical 'error' is not nearly as erroneous as Barbera, Bower, and Heilmann would have us believe; rather, it represents an approximate method of calculation used to prove relationships otherwise incalculable. Second, I argue that this approximate method was not developed by Boethius but was faithfully translated from his immediate Greek source, Nicomachus of Gerasa's (now lost) '*Εισαγωγὴ μουσική*. Third, I suggest that this method, or at least its basic principle, was not independently developed by Nicomachus either, for similar arithmetical methods arose within the early stages of the Greek commentary tradition on Plato's *Timaeus*.

Fig. 1.1 presents an arithmetical reduction of the first of the 'offending' proofs. (Since all three use the same so-called erroneous method, I will deal only with the first).

1. Let X, Y, and Z be arranged such that X is a comma from Y, and Y, in turn, is a minor semitone from Z.

2. Calculate the difference between the terms in the ratio of the comma (X:Y) and store the result as K. Likewise, calculate the difference between the terms in the ratio of the minor semitone (Y:Z) and store the result as M.

3. Since M (26,624) is larger than 3K (21,459) and smaller than 4K (28,612), ergo the minor semitone is larger than three commas but smaller than four, *quod erat demonstrandum*.

This acoustical relationship is correct, as I have already noted, but Barbera sensed something fraudulent afoot in its calculation, and thus he attempted to lay bare the 'fallacy' in Boethius' reasoning by offering a counterproof, a *reductio ad absurdum*.[41] Using the very same method, Barbera proved that the fifth is greater than two whole tones but less than three (Fig. 1.2): Let X, Y, and Z be arranged such that X is a whole tone from Y, and Y, in turn, a fifth from Z. Perform the same calculations as above, and since M (8) is larger than 2K (6) but smaller than 3K (9), ergo the fifth is larger than two whole tones but smaller than three.

A fifth, however, is larger than *three* tones but smaller than *four*. Thus the conclusion of Barbera's proof is, as he intended, absurd, and it convicts the method of equal absurdity; ergo, Boethius' demonstration is unreliable. Or so Barbera argues, and he attempts then to prove that Boethius only knew the correct relationships because he could hear them. Hence Barbera argues that Boethius' numerical demonstration is merely a *post hoc* justification of relationships already determined by empirical investigation: good acoustics, if bad arithmetic. Anja Heilmann has recently argued against Barbera's conclusion, noting that it is highly unlikely that Boethius devised a numerical proof to verify previous empirical observations, and this for two reasons.[42] First, such a manner of proceeding suits neither Boethius' usual methodology nor his understanding of music theory in general, and Heilmann cites as an example the eleventh, which Boethius denies is a consonance strictly on the

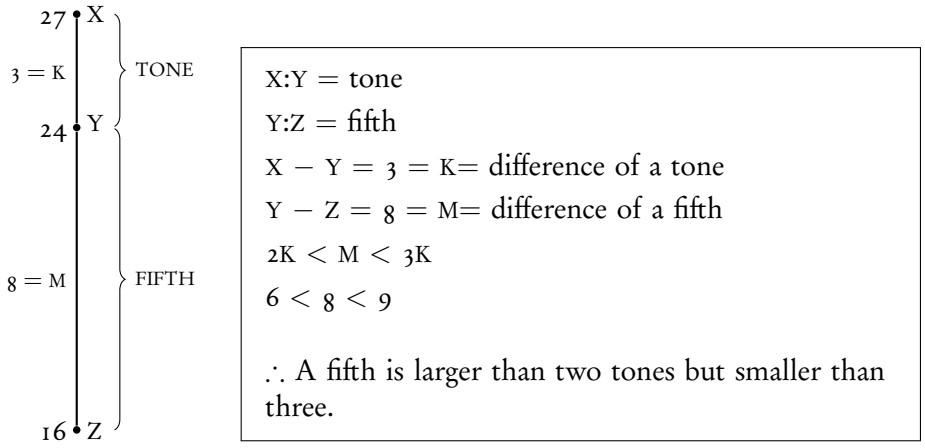


Figure 1.2: Barbera's counterproof that a fifth is larger than two tones but smaller than three (1981, 31).

[41] Barbera, "Interpreting an Arithmetical Error," 31.
[42] Heilmann, *Boethius' Musiktheorie und das Quadrivium*, 226–227.

basis of its multiple superbipartient ratio (8:3): arithmetic trumps acoustics, good or bad. Second, Heilmann counters that Boethius could have deduced the relationships from two earlier demonstrations in book three[43] and, therefore, without consulting a monochord, polychord, or conducting any empirical test at all.

Heilmann's critique of Barbera has some merit, but she still shares with him one fundamental premise: namely, that Boethius must have known that his conclusions were true by some means other than the proofs that he offers his readers. In short, both Barbera and Heilmann think that Boethius' *demonstratio per numeros* is somehow disingenuous, and they do not take it seriously. Barbera goes so far as to claim that we cannot take the arithmetical *demonstratio* at face value, for if we do, 'then we are treated here to one of the most fantastic coincidences in the history of science and musical theory. For there is no reason other than accident that would explain why the mere manipulation of numbers would depict three sophisticated acoustical relationships.'[44]

I submit that we can and should take the proofs seriously: the method is not the chicanery it may seem, nor are the correct conclusions a fantastically coincidental accident. This is borne out by taking a closer look at the proof's inner workings (and here I restrict the discussion to only the first of the three, since all three employ the same method). Ex. 1.3 works out the math, which amounts to this: to claim that M is greater than 3K but less than 4K is to claim that the minor semitone is greater than an approximation of three commas and less than an approximation of four commas. These approximations are calculated by substituting an arithmetic series (which maintains a common difference between terms) for a geometric series (which maintains a common ratio between terms).

Let me clarify this with two simple examples (Ex. 1.4a–b). If we calculate – as in ex. 1.4a – a sequence of four conjunct fifths (3:2, here calculated with 48:32 as the base ratio), we produce the geometric series: 32, 48, 72, 108, 162. If we replace this series with a sequence of terms generated by the 'distance' contained within the first ratio ($48 - 32 = 16$), we obtain the arithmetic series: 32, 48, 64, 80, 96. Clearly, the arithmetic series quickly falls short of its geometric counterpart: where four conjunct fifths sum to two octaves and a major third (162:32 or 2808 cents),[45] the arithmetic approxi-

[43] Namely, (1) chapter twelve's demonstration that the comma is larger than 75 : 74 and smaller than 74 : 73, and (2) chapter thirteen's demonstration that the minor semitone is greater than 20 : 19 and less than $19\frac{1}{2} : 18\frac{1}{2}$. Heilmann points out (ibid., 227) that it is a simple matter of straightforward arithmetic to conclude that 74 is greater than $3\frac{1}{2} \times 19$ but smaller than 4×19.

[44] Barbera, "Interpreting an Arithmetical Error," 33.

[45] A 'cent' is a logarithmic unit used to measure musical intervals. Each semitone in the twelve-tone equal-tempered scale

A geometric series of conjunct 'descending' commas is properly expressed:

$$\text{Y},\ \text{Y} \times (\text{Y}:\text{X})^1,\ \text{Y} \times (\text{Y}:\text{X})^2,\ \text{Y} \times (\text{Y}:\text{X})^3,\ \text{Y} \times (\text{Y}:\text{X})^4,\ \ldots\ \text{Y} \times (\text{Y}:\text{X})^n$$
$$(\text{for } n = 0, 1, 2, \ldots),$$

for which Boethius substitutes the arithmetic approximation:

$$\text{Y},\ \text{Y} - \text{K},\ \text{Y} - 2\text{K},\ \text{Y} - 3\text{K},\ \text{Y} - 4\text{K},\ \ldots\ \text{Y} - n\text{K}$$
$$(\text{for } n = 0, 1, 2, \ldots), \text{ where } \text{K} = \text{X} - \text{Y}$$

$$\therefore\ 3\text{K} < \text{M} < 4\text{K} = \text{Y} : (\text{Y} - 3\text{K}) < \text{Y} : (\text{Y} - \text{M}) < \text{Y} : (\text{Y} - 4\text{K}),$$

where $\text{Y} : (\text{Y} - 3\text{K})$ is an arithmetic approximation of $\text{Y} : (\text{Y} \times (\text{Y}:\text{X})^3)$,
$\text{Y} : (\text{Y} - 4\text{K})$ is an arithmetic approximation of $\text{Y} : (\text{Y} \times (\text{Y}:\text{X})^4)$,
and $\text{Y} : (\text{Y} - \text{M}) = \text{Y}:\text{Z}$, the ratio of the minor semitone (256 : 243).

Example 1.3: Functional equivalences within Boethius' method.

LARGE RATIO
GEOMETRIC
$a_n = a_n(\text{X}:\text{Y})^n \rightarrow 32, 48, 72, 108, 162$
ARITHMETIC
$a_n = a_n + (n\text{D}) \rightarrow 32, 48, 64, 80, 96$

$162 : 32 > 96 : 32$
2808 cents > 1902 cents

(a) $\text{X}:\text{Y} = 3:2$, $a_0 = 32$, $\text{D} = a_1 - a_0 = 16$

SMALL RATIO
GEOMETRIC
$a_n = a_n(\text{X}:\text{Y})^n \rightarrow 73, 74, 75.01, 76.04, 77.08$
ARITHMETIC
$a_n = a_n + (n\text{D}) \rightarrow 73, 74, 75, 76, 77$

$77.08 : 73 \approx 77 : 73$
94.2 cents $\approx$ 92.4 cents

(b) $\text{X}:\text{Y} = 74:73$, $a_0 = 73$, $\text{D} = a_1 - a_0 = 1$

Example 1.4: Geometric and arithmetic series: large vs. small ratios.

mation only sums to (roughly) an octave and a fifth (96:32 or 1902 cents). This same shortcoming will befall any arithmetic approximation of a geometric series that is generated by a relatively large ratio, e.g., an octave, fifth, fourth, or even a tone. And the same holds true for descending series as well, with the necessary inversion that a descending arithmetic series exceeds its geometric counterpart at about the same rate. But consider the case of 74 : 73 (ex. 1.4b). Four such ratios – correctly multiplied according to the geometric series 73, 74, 75.01, 76.04, 77.08 – sum to 77.08 : 73 or 94.2 cents. The arithmetic approximation of the same – 73, 74, 75, 76, 77 – sums to 77 : 73 or 92.4 cents. The correct calculation and its arithmetic approximation differ by only 1.8 cents, a difference that lies well below the threshold of human hearing (which hovers around 6 cents).

The discrepancy in the accuracy of the arithmetic approximation of 3 : 2 vs. 74 : 73 is easily explained: as the common ratio in a geometric progression shrinks, that is, as X : Y approaches 1, the

is divided into 100 cents. Hence, the octave contains 1200 cents. Though such a unit of measure is fundamentally alien to classical and medieval music theory, it does allow the easy comparison of ratios.

corresponding arithmetic series becomes, at least for its initial terms, an increasingly accurate approximation; and in the case of small, microtonal ratios, it succeeds with surprising precision. Since Barbera's counterproof is based on an arithmetic approximation of a relatively large ratio (9 : 8), it is bound to produce a nonsensical result (as is demonstrated in Fig. 1.5, which compares the actual values on the left and the approximate values on the right). The arithmetic series 27, 24, 21, 18, 15, which maintains the common difference of 3, is simply a poor approximation of the geometric series 27, 24, 21.33, 18.96, 16.86, 14.98, which maintains the common ratio of 9 : 8. Barbera's counterproof fails to land a decisive blow against Boethius' arithmetic method for one simple reason: approximate methods are rarely generalizable. Granted, Boethius' arithmetic method fails miserably for large ratios, but that does not prevent it from succeeding with some precision when dealing with small ratios. Since Boethius' construction of three and four commas is based on a ratio even smaller than 74 : 73, Boethius' approximations are just as accurate as that calculated in ex. 1.4b, as is clear from Fig. 1.6. Boethius' approximation of three commas is off by a mere 1.97 cents and the approximation of four by only 3.31 cents. Of course, the margin of error increases with every multiplication of the arithmetical difference; but the approximation still holds true for the calculation of eight and

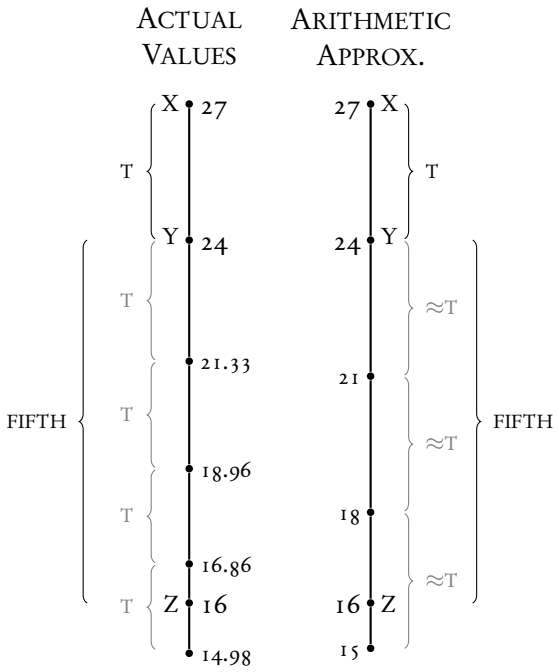
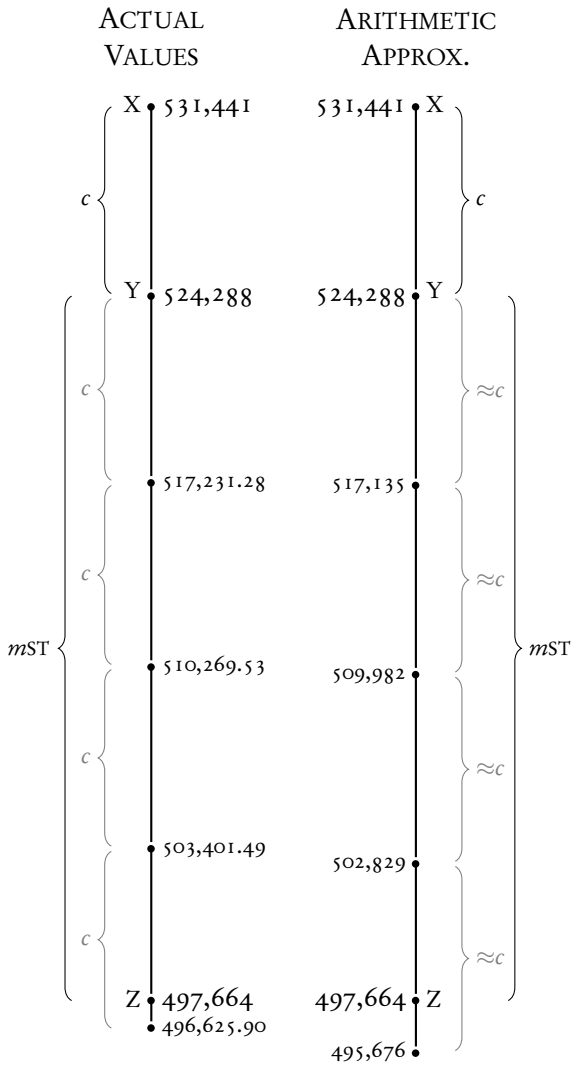


Figure 1.5: Comparison of actual values and approximate values in the computation of sequential tones (T) against a fifth.



Actual values (rounded to two decimal places):

$$524{,}288{:}503{,}401.49 < 524{,}288{:}497{,}664 < 524{,}288{:}496{,}625.90$$
$$= 70.38 \text{ cents} < 90.22 \text{ cents} < 93.84 \text{ cents}$$

Boethius' arithmetic approximation:

$$524{,}288{:}502{,}829 < 524{,}288{:}497{,}664 < 524{,}288{:}495{,}676$$
$$= 72.35 \text{ cents} < 90.22 \text{ cents} < 97.15 \text{ cents}$$

Figure 1.6: Comparison of actual values and Boethius' approximate values in the calculation of sequential commas (c) against a minor semitone (mST).

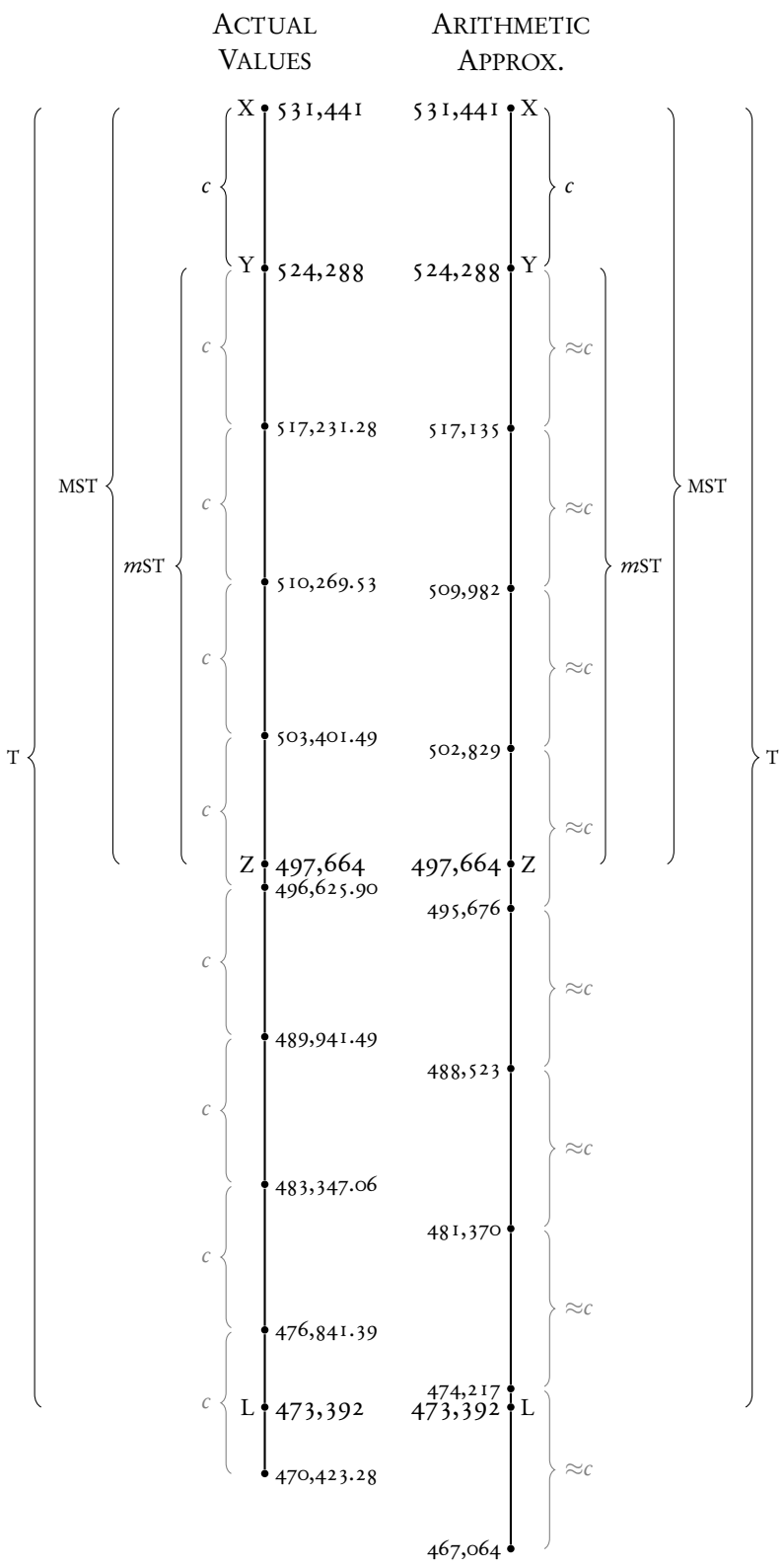


Figure 1.7: Comparison of actual values and Boethius' approximate values in the calculation of sequential commas (*c*) against a minor semitone (*m*ST), major semitone (MST), and whole tone (T).

nine commas, between which falls the whole tone, as is clear in Fig. 1.7, which summarizes all three proofs.

The payoff to these calculations should now be clear. Barbera claims, in no uncertain terms, that Boethius could not have determined this relationship with his *demonstratio per numeros* and that he must have relied upon his ear to determine it through empirical investigation. But in fact, the arithmetic demonstration calculates the relationship with just as much, if not more accuracy than empirical investigation could achieve. Why? Because Boethius' method ingeniously exploits the fact that geometrical progressions of very small ratios can be reasonably approximated with their arithmetic counterparts. And the method amounts to something very much like Ptolemy's observation (made in the course of his tetrachordal division at *Harm.* 1.15) that when dividing microtonal ratios 'the differences [are] kept equal, and the ratios almost equal, as equal ratios are impossible' (*τῶν μὲν ὑπεροχῶν τηρουμένων ἴσων, τῶν δὲ λόγων παρίσων, ἐπεὶ μὴ δυνατὸν ἴσων*).[46] Within the context of Boethius' proofs, it is not so much that the ratios could not be equal (as they are all rational, whole number ratios), but rather that it is unreasonable to expect him to calculate them. The exact numerical demonstration, employing only whole number ratios, requires numbers in the quadrillions or more. Although Boethius is capable of astonishing feats of staggering tedium, we can hardly fault him for not attempting to work out, in roman numerals no less, whether the cube and fourth power of three to the twelfth over two to the nineteenth was less or greater than two to the eighth over three to the fifth. Even with Arabic numerals, it proved too much to keep the calculations in line when, nearly a millennium after Boethius, Faber Stapulensis mounted an exact proof in his 1496 *Elementa musicalia* (f. g2r–g2v). Lorenzo Gazio, in a letter to Pietro Aaron,[47] rather charitably admonished Faber's printer for muddling the calculations, but Gazio's own attempt to rectify Faber's errors introduced new errors of his own. Pietro Aaron, in reply, claimed to have begun computing the proof anew but abandoned the project not because the numbers were too large, but because he had better things to do.[48] Realistically speaking, the exact numerical proof was incalculable, and the approximate method provided an easily calculable, methodologically sound, and surprisingly ac-

[46] *Harm.* 34.13–14.

[47] Bonnie Blackburn, Edward Lowinsky, and Clement Miller, *A Correspondence of Renaissance Musicians* (Oxford: Oxford University Press, 1991), 945–946 (Sparato Corr. 102).

[48] ibid., 949 (Sparato Corr. 103): non tanto per gli grandi numeri che gli occorrevano, quanto per essere in altre cose più necessarie occupato.

curate alternative. And it remained the only kind of proof even attempted for the next thousand years.

Both Barbera and Heilmann are sensitive to the fact that another source, namely Nicomachus' lost music treatise, may lurk behind Boethius' proofs, but neither seriously considers the implications of this possible borrowing.[49] If the arithmetic procedure that Boethius employs were one that he had devised himself, my following reconstruction of the method's pre-Boethian origins would be seriously undermined. Thus a review of the evidence is in order so as to determine whether, in fact, Boethius has translated his proof from Nicomachus.

Internal cross-references within the *De institutione musica* and external testimony from Iamblicus and others both strongly suggest that book three is drawn, as a whole, from Nicomachus' lost '*Εισαγωγὴ μουσική*.[50] This is merely circumstantial, however. More conclusive, and more relevant to my argument, is the presence of similar arithmetic approximations in the course of book four's monochord division, a division that Calvin Bower and Stefan Hagel persuasively demonstrate to have likewise come from Nicomachus.[51] An examination of book four, chapter six *Monochordi netarum hyperboleon per tria genera partitio* (diagrammed in Fig. 1.8) will suffice to illustrate my point.

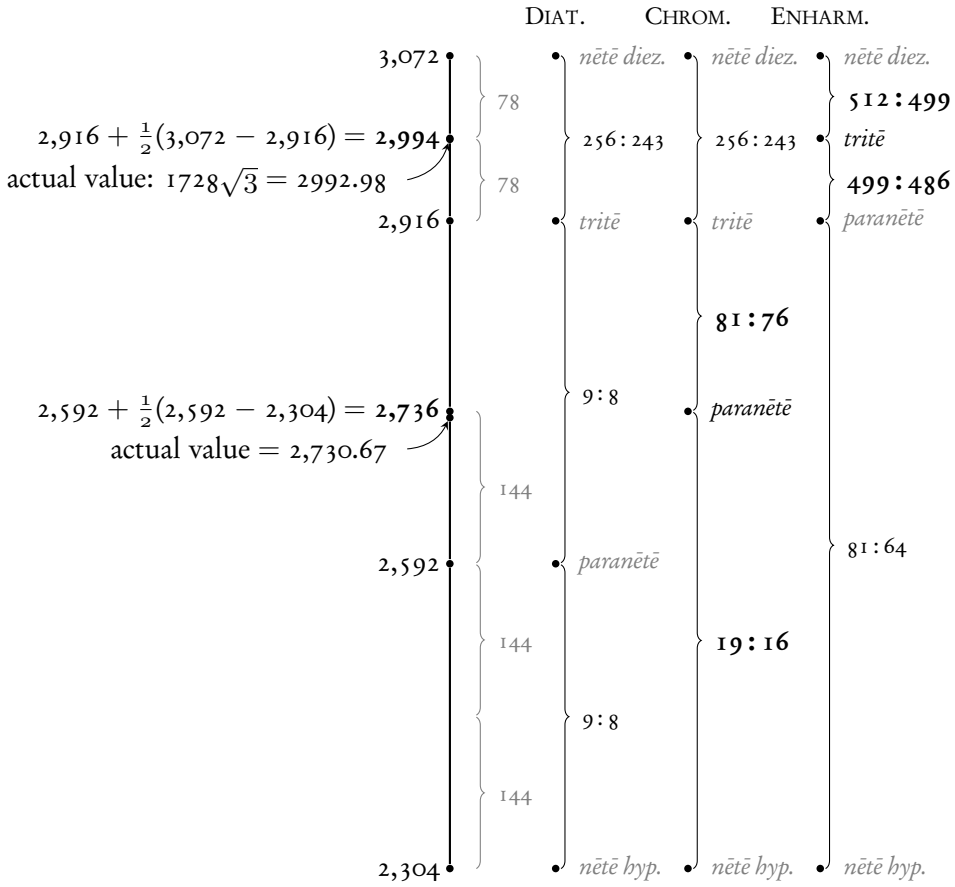
Boethius first partitions the diatonic tetrachord according to the standard Pythagorean ratios – 9 : 8, 9 : 8, 256 : 243 – taking 2,304 as a base number so as to maintain whole number ratios throughout the double-octave division. The partitions of the chromatic and enharmonic tetrachords are both derivative from this diatonic framework. Two calculations are important here. First, the chromatic *paranētē*, the second highest pitch in the tetrachord, is determined through an arithmetic approximation of three semitones (144 + 144 + 144); second, the two close-packed quarter-tones on either side of the enharmonic *tritē* at the bottom of the tetrachord are derived by simply dividing the bounding minor semitone 'space' in half, a method that generates intervals with equal distances of 78. Once again, Boethius has substituted an arithmetic series (or mean) for a far more difficult or even impossible to calculate geometric series (or mean). And again, the resultant intervals are, acoustically speaking, indistinguishable from their correctly computed counterparts.

[49] Barbera, "Interpreting an Arithmetical Error," 27; Heilmann, *Boethius' Musiktheorie und das Quadrivium*, 228.

[50] See Calvin Bower, "Boethius and Nicomachus: An Essay Concerning the Sources of *De institutione musica*," *Vivarium* 16 (1978): 11.

[51] ibid., 19–26; Stefan Hagel, *Ancient Greek Music: A New Technical History* (New York: Cambridge University Press, 2010), 160–166.

Barbera, in a 1977 study of geometric and arithmetic tetrachord divisions, claims that Boethius' method of dividing the enharmonic *pyknon* (that is, the minor semitone between the *paranētē* and the *nētē*) 'produces two different intervals, 499:486 and 512:499.'[52] He is, of course, absolutely correct, but such a claim in this context amounts to academic hair splitting, for these 'two different intervals'



Boethius' approximated chromatic *paranētē* (2,736) differs from its 'correct' value (2,730.67) by only 3.38 cents:

2,736 : 2,304 = 297.51 cents and 2,730.67 : 2,304 = 294.13 cents.

Likewise, Boethius' approximated 'Aristoxenian' quarter-tones,

512 : 499 and 499 : 486 = (respectively) 44.52 cents and 45.70 cents,

are nearly identical, differing by only 1.18 cents, well below the threshold of perception.

Figure 1.8: Boethius' partition of the monochord of the netai hyperboleon through three genera (*Inst. mus.* 4.6).

[52] André Barbera, "Arithmetic and Geometric Divisions of the Tetrachord," *Journal of Music Theory* 21 (1977): 309.

differ acoustically by a mere and imperceptible 1.18 cents. Barbera further claims that the 'curious looking' ratios that the method generates – all printed bold in Fig. 1.8 – 'necessarily must have been considered before determining that 2,304 is the smallest integer such that all of the intervals of the Greater and Lesser Perfect Systems could be characterized by integers.'[53] This, however, is only partly true and makes the determination of 2,304 appear more difficult than it actually need be. For Boethius did not have to concern himself with whether any given number in the partition had a four hundred and ninety-ninth part or a four hundred and eighty-sixth part. All that must be ensured for the division to succeed is that a number be chosen such that all generated values of the diatonic double octave are even numbers. That is to say, the 'curious looking' ratios are better explained as an *a posteriori* artifact of the partition method and not as an *a priori* generative principle.

Calvin Bower tries to explain away these odd ratios by appealing to the primacy of the arithmetic mean, but in so doing he slightly mis-characterizes Nicomachus' arithmetic method. Bower dismisses the notion that computational expediency was the driving force behind the arithmetic derivation of the chromatic *paranētai* and enharmonic *tritai*. Instead Bower argues that 'Nicomachus, the *arithmetician* [sic], considered arithmetic proportionality prior by nature to the other types of proportionality.'[54] This may be true, but Boethius' language, assuming it is at least marginally representative of Nicomachus' original Greek, does not fully bear this out. Boethius explicitly describes the computation of the chromatic *paranētē* as a means through which 'we can obtain a number distant by three semitones from the nete hyperboleon.'[55] Moreover, the number generated by Boethius' method (2,736) is not the arithmetic mean of any two numbers in the tetrachord. If the arithmetic mean had ultimate priority, Boethius could have derived an (admittedly much less accurate) chromatic *paranētē* by calculating the arithmetic mean of 2,916 : 2,592 and placing the *paranētē* at 2,754. Yet he doesn't. Boethius also explicitly describes the two enharmonic quarter-tones as 'half the interval of the minor semitone,'[56] and he claims, without corrective or qualification, that these quarter-tones can be obtained by calculating half the distance between the terms in the minor semitone ratio,[57] even though

[53] Barbera, "Arithmetic and Geometric Divisions," 309.

[54] Bower, "Boethius and Nicomachus," 26.

[55] *Inst. mus.* 4.6 (320.27–321.4): si distantiam paranetes hyperboleon et netes hyperboleon diatonici generis sumpserimus eiusque dimidium paranete hyperboleon, quae est diatonici generis, apponamus, habebimus numerum tribus semitoniis ab hyperboleon nete distantem; et erit haec in chromatico genere paranete hyperboleon.

[56] *Inst. mus.* 4.6 (321.17–19): constat autem tetrachordum enarmonii generis ex duobus integris tonis et diesi ac diesi, quae sunt dimidia spatia semitonii minoris.

[57] *Inst. mus.* 4.6 (321.19–322.2): distantiam eam, quae est inter neten diezeugmenon et paraneten hyperboleon enarmo-

this method explicitly maintains equal distances, not equal ratios. The most straightforward interpretation of Boethius' and, by extension, Nicomachus' language is precisely what Bower wants to deny: Boethius describes geometric relationships but expedites the math by using arithmetic calculations.

Boethius' manner of dividing the chromatic and enharmonic tetrachords is strikingly similar to the manner in which he proves that the minor semitone is greater than three commas and less than four. In both cases, Boethius reasonably calculates an arithmetic approximation of a geometric proportion that either (a) cannot be expressed as a rational or whole number, or (b) exceeds the limits of reasonable computation. These two instances of the same basic principle strongly suggest the presence of a single mind solving different problems in similar ways, and evidence independent of this methodological congruency points to Nicomachus as the likely, if not certain, source.

What has Plato's *Timaeus* to do with these arcane musicological calculations? The answer, as suggested above, lies in the letter of Plato's division of the world soul. I quote the text again, this time in Greek:

> ἤρχετο δὲ διαιρεῖν ὧδε. μίαν ἀφεῖλεν τὸ πρῶτον ἀπὸ παντὸς μοῖραν, μετὰ δὲ ταύτην ἀφῄρει διπλασίαν ταύτης, τὴν δ' αὖ τρίτην ἡμιολίαν μὲν τῆς δευτέρας, τριπλασίαν δὲ τῆς πρώτης, τετάρτην δὲ τῆς δευτέρας διπλῆν, πέμπτην δὲ τριπλῆν τῆς τρίτης, τὴν δ' ἕκτην τῆς πρώτης ὀκταπλασίαν, ἑβδόμην δ' ἑπτακαιεικοσιπλασίαν τῆς πρώτης. μετὰ δὲ ταῦτα συνεπληροῦτο τά τε διπλάσια καὶ τριπλάσια διαστήματα, μοίρας ἔτι ἐκεῖθεν ἀποτέμνων καὶ τιθεὶς εἰς τὸ μεταξὺ τούτων, ὥστε ἐν ἑκάστῳ διαστήματι δύο εἶναι μεσότητας, τὴν μὲν ταὐτῷ μέρει τῶν ἄκρων αὐτῶν ὑπερέχουσαν καὶ ὑπερεχομένην, τὴν δὲ ἴσῳ μὲν κατ' ἀριθμὸν ὑπερέχουσαν, ἴσῳ δὲ ὑπερεχομένην. ἡμιολίων δὲ διαστάσεων καὶ ἐπιτρίτων καὶ ἐπογδόων γενομένων ἐκ τούτων τῶν δεσμῶν ἐν ταῖς πρόσθεν διαστάσεσιν, τῷ τοῦ ἐπογδόου διαστήματι τὰ ἐπίτριτα πάντα συνεπληροῦτο, λείπων αὐτῶν ἑκάστου μόριον, τῆς τοῦ μορίου ταύτης διαστάσεως λειφθείσης ἀριθμοῦ πρὸς ἀριθμὸν ἐχούσης τοὺς ὅρους ἓξ καὶ πεντήκοντα καὶ διακοσίων πρὸς τρία καὶ τετταράκοντα καὶ διακόσια (35b4–36b3).

A quick scan of the underlined Greek terms reveals a striking feature of this famous passage: spatial terms (διάστημα and διάστασις) appear where we would rightly expect Plato to use λόγος, or 'ratio,' a term not used anywhere in the division. For it is *intervals* or *spaces* that are explicitly deemed duple, triple, hemiolic, etc.; even the λεῖμμα is not a ratio but a space bounded, number to number, by 256 and 243.

> nion sumo. Sed quoniam nete diezeugmenon est ·$\overline{\text{III}}$·LXXII· paranete autem hyperboleon enarmonios ·$\overline{\text{II}}$·DCCCCSVI· horum distantia erit ·CLVI·. Horum sumo dimidiam partem, qui sunt ·LXXVIII·. Hos adicio ·$\overline{\text{II}}$·DCCCCXVI·, fient ·$\overline{\text{II}}$·DCCCCXCIIII·. Haec erit ·EE· trite hyperboleon enarmonios.

Plato's diffuse language seems to have occasioned or at least encouraged some confusion within the commentary tradition. Andrew Barker[58] has highlighted the marked overlap between λόγος and διάστημα within the tradition. Theon of Symrna's *Expositio rerum mathematicarum ad legendum Platonem utilium* preserves Thrasyllus' definition of διάστημα, which he conflates with the Euclidean λόγος: an interval, Thrasyllus writes, is 'a specifically qualified relation (σχέσις) that notes have to one another, such as the fourth, the fifth, and the octave' (διάστημα δέ φησιν εἶναι φθόγγων τὴν πρὸς ἀλλήλους ποιὰν σχέσιν, οἷον διὰ τεσσάρων, διὰ πέντε, διὰ πασῶν).[59] Nicomachus himself is not exempt from criticism: in his Ἁρμονικὸν ἐγχειρίδιον (chapter twelve), he initially toes the Aristoxenian line[60] and defines διάστημα as what lies between (μεταξύτης) two discrete pitches. But he too relates διάστημα to λόγος: 'a relation (σχέσις),' he continues, 'is the ratio that *measures the distance* within each interval' (διάστημα δ' ἔστι δυοῖν φθόγγων μεταξύτης. σχέσις δὲ λόγος ἐν ἑκάστῳ διαστήματι μετρητικὸς τῆς ἀποστάσεως).[61] Plutarch, Adrastus, and Theon of Smyrna all write themselves into hopeless muddles, and Barker wryly observes that the 'confusion is endemic.'[62] Though Barker was concerned only with the Greek tradition, the conflation spills into the Latin tradition as well. And Calcidius, the next in our Platonic triptych, is a prime example.

1.6 Calcidius

Calcidius bears the considerable honor and the heavy burden of being the first and only Latin commentator on the *Timaeus* from the ancient world. And much effort has been spent trying to determine precisely what and who he preserves. The influence, or absence, of Porphyry has been central to the debate, and Waszink, in his edition's *apparatus fontium*, is at pains to adduce a great number of *comparanda* in Porphyry's oeuvre; Sodano's collection of the surviving fragments of Porphyry's

[58] Barker, "Early *Timaeus* Commentaries."

[59] *Exp.* 48.8–10, echoing Euclid V, def. 3; cf. Theon's own definition (*Exp.* 73.16–18): λόγος δέ ἐστιν ὁ κατ' ἀνάλογον δυοῖν ὅρων ὁμογενῶν ἡ πρὸς ἀλλήλους [αὐτῶν] ποιὰ σχέσις, οἷον διπλάσιος, τριπλάσιος, on which see Barker, "Early *Timaeus* Commentaries," 81–82. Compare also *Exp.* 81.6–16: διαφέρει δὲ διάστημα καὶ λόγος, ἐπειδὴ διάστημα μέν ἐστι τὸ μεταξὺ τῶν ὁμογενῶν τε καὶ ἀνίσων ὅρων, λόγος δὲ ἁπλῶς ἡ τῶν ὁμογενῶν ὅρων πρὸς ἀλλήλους σχέσις. διὸ καὶ τῶν ἴσων ὅρων διάστημα μὲν οὐδέν ἐστι μεταξύ, λόγος δὲ πρὸς ἀλλήλους εἷς καὶ ὁ αὐτὸς ὁ τῆς ἰσότητος· τῶν δὲ ἀνίσων διάστημα μὲν ἓν καὶ τὸ αὐτὸ ἀφ' ἑκατέρου ⟨πρὸς⟩ ἑκάτερον, λόγος δὲ ἕτερος καὶ ἐναντίος ἑκατέρου πρὸς ἑκάτερον· οἷον ἀπὸ τῶν β' πρὸς τὸ ἓν καὶ ἀπὸ τοῦ ἑνὸς πρὸς τὰ β' διάστημα ἓν καὶ τὸ αὐτό, λόγος δὲ ἕτερος, τῶν μὲν δύο πρὸς τὸ ἓν διπλάσιος, τοῦ δὲ ἑνὸς πρὸς τὰ β' ἥμισυς.

[60] See above, 1.3 (p. 16).

[61] Nic., *Harm.* 261.8–10.

[62] Barker, "Early *Timaeus* Commentaries," 82.

lost *Commentary on the Timaeus* followed suit.[63] But there is little reason to assume Calcidius' use, to say nothing of his knowledge, of Porphyry's commentary.[64] First, at the very level of the *diuisio textus*, Calcidius parts ways with Proclus, who ostensibly followed Porphyry's division. And when we direct our attention to 35bff., whether or not Calcidius knew of Porphyry's commentary, he certainly does not follow his lead, but turns instead to the (also lost) *Εις τὸν Τίμαιον* by Adrastus of Aphrodisias, as is suggested by triangulating parallel citations in Theon of Smyrna and Macrobius. It is from Adrastus that Calcidius adopts the triple form of the lambda diagram (a tradition that extends, according to Plutarch, back to Krantor). This alone separates Calcidius sharply from Porphyry, who in his commentary followed the tradition of a linear diagram, along with Theodorus, Severus, and Proclus. To these usual arguments, all noted by Dillon,[65] we can now add another: namely that Calcidius' Latin continues the terminological slippage between *ratio* and *interuallum* that, as we will see, is explicitly rejected by Porphyry. Calcidius' language thus seems, at times, to preserve a pre-Porphyrian approach to Plato's dialogue.

Even the Greek text that Calcidius translated, insofar as we can see through his often oblique translation, suggests a close alliance to a Middle Platonic text, a recension which is no longer witnessed by the direct manuscript tradition (or at least not in Burnet's *apparatus criticus* to the OCT edition of the *Timaeus*) but is occasionally hinted at by Middle Platonic handbooks (such as Alcinous' *Didascalicon*). For example, at 38d2 Alcinous knows Venus not by the Timaean term *ἑωσφόρον* ('dawn-bringer') but rather as *φώσφορος* ('light-bringer'). This variant is not attested in the the extant manuscripts of the *Timaeus*, but it does appear as *Lucifer* in Calcidius (31.1) and, I should add, in Cicero's Latin *Timaeus* as well (9.29 [204.5]).[66] Likewise, Alcinous, when quoting 40c1–2, a passage that describes the earth as *φύλακα καὶ δημιουργὸν νυκτός τε καὶ ἡμέρας* ('guardian and creator of night and day'), omits *καὶ δημιουργὸν*, an omission shared by Calcidius (*diei noctisque custodem*: 33.21) but not by Cicero (*diei noctisque effectricem eandemque custodem*: 10.27 [210.13–14]), which John Dillon

[63] Angelo Raffaele Sodano, ed., *Porphyrii In Platonis Timaeum commentariorum fragmenta* (Naples: s. n., 1964). Andrew Smith's *Porphyrii philosophi Fragmenta*, Bibliotheca scriptorum Graecorum et Romanorum Teubneriana (Stuttgart: Teubner, 1993) does not consider the Commentary on the Timaeus. See also the brief remarks by Gretchen Reydams-Schils, "Calcidius," in *The Cambridge History of Philosophy in Late Antiquity*, ed. Lloyd P. Gerson (Cambridge: Cambridge University Press, 2010), 507–508, who notes that even at moments where Porphyry's influence seems strongest, the threads of influence remain complex and inconclusive.

[64] On this, Dillon's point (Dillon, *The Middle Platonists*, 403) is perhaps too strong, but correct with respect to the Timaean commentary: 'But to the unprejudiced eye there is nothing in Calcidius that requires us to postulate his acquaintance with any distinctively Neoplatonic doctrine, and much to suggest that he knew nothing of Porphyry's *Commentary*.'

[65] ibid.

[66] John Dillon, trans., *Alcinous. The Handbook of Platonism* (Oxford: Clardneon Press, 1993), 131.

suggests is an 'ideological emendation' explained by an 'unease in Middle Platonic circles' to allow the 'august term δημιουργός to characterize anything other than Cosmic Intellect,' the second of the three divine entities of Middle Platonism.[67] Finally, there is the famous question of a second ἀεί (*semper*, always) at 27d6–28a1: 'What is it that always exists, having no generation, and what is it that is *always* coming to be, never having existence.'[68] Calcidius omits the second ἀεί,[69] which is a common (and perhaps the original) reading, found in Cicero as well;[70] nonetheless, it is worth noting that it is also the reading overwhelmingly preferred amongst the early exegetes, including Nicomachus, Numenius, Alexander of Aphrodisias and Sextus Empiricus.[71] Alcinous' explanation of *genetos* as an indication that the 'world is *always* in a state of becoming' (ἀεὶ ἐν γενέσει ἐστί) suggests that he may have known the ἀεὶ (as pointed out by Whittaker and Dillon).[72] It remains possible that this came to him not by way of the *Timaeus* itself, but through Taurus' famous discussion of *genetos* (preserved by Philoponus), whose third possible meaning of 'genetos' was: 'being perpetually (ἀεὶ) in process of generation.'[73]

Calcidius first begins his discussion of the division of the world soul not with arithmetic or harmonics, but with geometry, which, he asserts, 'holds the foundational position, to which the others (that is arithmetic and harmonics) are substructures' (*geometrica uicem obtinet fundamentorum, ceterae uero substructionis*).[74] On this point, Thomas Mathiesen claims that Calcidius 'departs from tradition,'[75] but as my argument thus far suggests, it is hardly a departure but rather a close adherence to a Platonic tradition of geometric exegesis, unless we *a priori* suppose (as Mathiesen seems to do) that Calcidius will present us with a straightforwardly Pythagorean position (which, of course, he doesn't). I do not want to suggest that Calcidius in any way claimed with Severus that the soul was a 'geometrical magnitude'; indeed he doesn't, as he follows the Numenian tradition of identifying

[67] Dillon, *Alcinous. The Handbook of Platonism*, 135.

[68] τί τὸ ὂν ἀεί, γένεσιν δὲ οὐκ ἔχον, καὶ τί τὸ γιγνόμενον μὲν ἀεί, ὂν δὲ οὐδέποτε.

[69] 20.15–16: Est igitur, ut mihi quidem uidetur, in primis diuidendum, quid est quod semper est, carens generatione, quid item quod gignitur, nec est semper. Wazink notes (*ad loc.*) that 'nec est semper non ad hoc ἀεί pertinet, sed ad 28a1 ὂν δὲ οὐδέποτε.

[70] 2.3 (178.3–4): Quid est quod semper sit neque ullum habeat ortum et quod gignatur nec umquam sit?

[71] See John Dillon, "Tampering with the *Timaeus*: Ideological Emendations in Plato, with Special Reference to the *Timaeus*," *American Journal of Philology* 110 (1989): 60.

[72] John Whittaker, "*Timaeus* 27D5ff," *Phoenix* 23 (1969): 181–185 and Dillon, "Tampering with the *Timaeus*," 61.

[73] Taurus, apud Philoponum *contra Proclum* 145.13–147.25, trans. in Sorabji, *Philosophy of the Commentators*, vol. 2: *Physics*, 162–164.

[74] *In Tim.* 32 (82.3–4).

[75] Thomas J. Mathiesen, *Apollo's Lyre: Greek Music and Music Theory in Antiquity and the Middle Ages*, Publications of the Center for the History of Music Theory and Literature (Lincoln, NB: University of Nebraska Press, 1999), 616.

the indivisible substance with the higher soul and the divisible substance with the lower soul, the *anima stirpea* that bestows vital power on all living things.[76] Nevertheless, geometry does have an explicitly foundational role: and Calcidius begins by highlighting the word *portio*, his translation for μοῖρα: Plato, he writes, 'does not say that he has taken a *part* of the simple and incorporeal soul-stuff, but rather a portion, that is to say, a kind of likeness of a part, which is similar to the geometrical point.'[77] From there he proceeds to build the first Adrastan lambda diagram, on whose left and right there flow from the apex of this geometrical point the first even and odd linear, planar, and cubic numbers: 2 4 8 and 3 9 27. After the geometrical discussion, there follows a 'Pythagorean' digression in chapters 35–38 on the properties of number, which bear at times a marked affinity to Macrobius, stemming no doubt from an overlap in their source material here, which may ultimately be, as Frank Robbins has argued, a lost work of Pythagorean arithmology, which must not be identified as work by Posidonius, a thesis abandoned some time ago.[78]

Thereafter, Calcidius addresses in detail the harmonic construction of the world soul. And it is here that we find *interuallum*, *spatium*, and *ratio* used interchangeably. In chapter 41, where he first begins to fill in the initial double and triple division (following the tradition of taking 6 as the first term, witnessed by Plutarch among others), Calcidius writes: 'because the number six makes one of the limits and likewise twelve the other limit, and they differ from each other according to the *ratio* of duple quantity, two means are interposed, one eight, the other nine.'[79] Later in the same argument (cap. 42) he claims that: 'the mean number 32, when compared against the limit 24 produces the *interval* of the epitritic quantity.'[80] Later still (cap. 43) we are told that 'nine against eight produces the epogdoic *space*,' and he continues, 'and by these (that is these epogdoic spaces) the limits that are distant from each other by the duple *ratio* are filled up.'[81] There is no need to belabor the point with more examples, which could indeed be multiplied; nor do I want unduly to fault Calcidius on this point. I wish only to highlight the fact that Adrastus, on whom he is seemingly reliant at

[76] On which, see Phillips, "Numenian Psychology in Calcidius?"

[77] *In Tim.* 33 (82.18–20): Portionis quoque elocutio notanda est; non enim partem quippe simplicis et incorporeae rei, sed portionem, id est partis instar, dixit esse sublatum, quod est geometricae illius notae simile.

[78] Frank Robbins, "Posidonius and the Sources of Pythagorean Arithmology," *Classical Philology* 15 (1920): 309–322; Frank Robbins, "The Tradition of Greek Arithmology," *Classical Philology* 16 (1921): 97–123.

[79] *In Tim.* 41 (89.22–90.1): Quia sex numerus facit unum limitem et item duodecim secundum efficit limitem iuxta rationem duplicis quantitatis et a se distant, interponuntur duae medietates, una octonarii numeri, altera nouenarii.

[80] *In Tim.* 42 (91.13–15): Triginta duo medietas aduersum uiginti quattuor limitem conparata facit interuallum epitritae quantitatis.

[81] *In Tim.* 43 (91.21–23): Quia igitur nouem et octo epogdoum faciunt spatium et ex his duo limites dupli ratione distantes, id est sex et duodecim conplentur, recte dixit epogdoi spatio epitritorum omnium interualla conpleri.

this point in the argument (though this passage has no parallel in Theon of Smyrna, and thus we cannot know precisely what his Greek text looks like),[82] simply made no strong distinction between διάστημα, διάστασις, and λόγος. That is, he follows the long tradition, with deep Platonic roots, of using the terms interchangeably. Even though Calcidius gives us no 'definition' of λόγος or διάστημα such as we find in Thrasyllus, Theon, and Nicomachus, his free use of the terms tellingly reveals the conflation within his source material.

Although this peculiar conflation of λόγος/*ratio* and διάστημα/*interuallum* has not garnered much attention among modern historians of music theory, it was not lost on at least one of the ancient commentators, namely the third-century Neoplatonic philosopher, Porphyry, whose lost commentary on the *Timaeus* can be partially glimpsed between the lines of Macrobius' *Commentarii in Somnium Scipionis*, the third of our three late-ancient Platonists.

1.7 Macrobius

In Macrobius this conflation has been cleaned up. But before Macrobius 'quotes' the *Timaeus* (*ad ipsa uerba Platonis*) near the beginning of book two, he tells us that – so as not to explain one obscure text with an equally difficult text – he needs to address a few explanatory preliminaries.[83] These preliminaries are precisely the same points made by Calcidius – the geometrical explanation of the point, the line, the surface, and the solid (2.2.3ff). Hardly, again, a departure from tradition. There is, however, one significant difference between their expositions. Macrobius makes no reference to a lambda diagram. Though he separates the even numbers from the odd, he does not explain them as flowing on either side from the monad, but rather as interwoven (*contextio*) in alternation.[84] This is not surprising, given Macrobius' reliance on Porphyry's commentary, who, as already noted,[85] followed the linear diagram tradition. On this point, Calcidius' and Macrobius' differing models of

[82] Judging from Calcidius' translation of the *Timaeus*, the Greek terms he translates would be (as expected): διάστημα = *interuallum*; διάστασις = *spatium*; λόγος = *ratio*. Thoughout the passage, there are occasional hints that Calcidius is thinking in Greek, e.g.: Rursum enim *decem et octo* numerus aduersum *decem et sex* [only this once, everywhere else *sedecim*] numerum epogdoi rationem obtinet (*In Tim.* 44 [91.24–25]).

[83] *In Som. Scip.* 2.2.2 (99.26–100.2): sed ne quod in patrocinium alterius expositionis adhibetur ipsum per se difficile credatur, pauca nobis praemittenda sunt quae simul utriusque intellegentiam faciant lucidiorem.

[84] *In Som. Scip.* 2.2.1 (99.19–24): Hinc Plato postquam et Pythagoricae successione doctrinae et ingenii proprii divina profunditate cognovit nullam esse posse sine his humeris iugabilem competentiam, in Timaeo suo mundi animam per istorum numerorum contextionem ineffabili providentia dei frabricatoris instituit. *In Som. Scip.* 2.2.14 (101.19–22): Timaeus igitur Platonis in fabricanda mundi anima consilium divinitatis enuntians ait illam per numeros fuisse contextam. *In Som. Scip.* 2.2.17 (102.11–12): Alternis enim, ut animadvertere faciles est, processit illa contextio.

[85] See above 1.6 (p. 33).

celestial harmony offer solid confirmation. Both refer the numbers of the initial division to the planetary distances, but the numerical sequence in Calcidius betrays a 'collapsed' lambda diagram that thus follows the consecutive numerical sequence: 1 2 3 4 8 9 27 (monad even odd even even odd odd).[86] Macrobius, on the contrary, who explicitly attributes his position to Porphyry (*hanc Platonicorum persuasionem Porphyrius libris inseruit quibus Timaei obscuritatibus non nihil lucis infudit*),[87] maintains the linear model of the harmonic division and thus preserves the strict alternation of evens and odds (1 2 3 4 9 8 27), even though preserving this order comes at the cost of a nonsensical musical system, which sums to 46,656:1 or 15 octaves and a tritone.[88] Flamant on this point rightly argues that the celestial harmony of both Calcidius and Macrobius derives ultimately from Adrastus, but Macrobius reveals Porphyry's interventions, who 'corrected Adrastus in order to respect the natural [even and odd] alteration of the linear diagram.'[89]

Following the geometrical preliminaries, Macrobius presents (2.2.15) what he tells us is a translation (*ipsa uerba Platonis*) of *Timaeus* 35b. His text reads as follows:[90]

> Nunc ad ipsa Platonis uerba ueniamus. nam cum de deo animam mundi fabricante loqueretur, ait: primam ex omni fermento partem tulit: hinc sumpsit duplam partem prioris, tertiam uero secundae hemioliam sed primae triplam, et quartam duplam secundae, quintam tertiae triplam, sextam primae octuplam et septimam uicies septies a prima multiplicatam. post hoc *spatia quae inter duplos et triplos numeros hiabant* insertis partibus adimplebat, ut *binae medietates* singula spatia colligarent, ex quibus *uinculis* hemiolii et epitriti et epogdoi nascebantur.

This text, though, is not a literal translation, but rather a tidied version of the *Timaeus*. Nowhere in Macrobius' translation are *interualla* or *spatia* described as duple or triple, hemiolic or epitritic (as in Calcidius' translation). Rather, he paraphrases Plato with very careful language and refers not to the 'intervals of double and triple quantity' (Calcidius) but to the 'spaces (*spatia*) that stand open

[86] *In Tim.* 96 (148.12–19): Sectioni quoque partium ex quibus animam constituit positio planetum conueniens uidetur, cum unam ab uniuerso facit sumptam primitus portionem, id est minimam, a terra ad lunam; cuius duplicem secundam, id est quae inter lunam solemque interiacet, cuius triplam tertiam, scilicet Ueneris, quartam duplicem secundae, id est quadruplam primae, Mercurii, *octuplam uero Martis, quae quinta sectio est, sextam triplam tertiae, id est regionem seu circulum Iouis*, septem porro et uiginti partium Saturni nouissimam sectionem.

[87] *In Som. Scip.* 2.3.15 (107.1–2).

[88] *In Som. Scip.* 2.3.14 (106.21–31): et statuerunt hoc esse credendum, ut quantum est a terra usque ad lunam, duplum sit a terra usque ad solem, quantumque est a terra usquae ad solem, triplum sit a terra usque ad Venerem, quantumque est a terra usque ad Venerem, quater tantum sit a terra usque ad Mercurii stellam, quantumque est ad Mercurium a terra, *novies* tantum sit a terra usque ad Martem, et quantum a terra usque ad Martem est, *octies* tantum sit a terra usque ad Iovem, quantumque est a terra usque ad Iovem, septies et vicies tantum sit a terra usque ad Saturni orbem.

[89] Jacques Flamant, *Macrobe et le Néo-Platonisme latin, à la fin du IVe siècle*, Études Préliminaires aux Religions Orientales dans l'Empire Romain 58 (Leiden: Brill, 1977), 373.

[90] *In Som. Scip.* 2.2.15 (101.27–102.2).

between the double and triple numbers,' and allows hemiolic, epitritic and epogdoic to stand as substantives,[91] rather than as adjectives modifying *spatia*(=διαστάσεις), as in the *Timaeus*. These points (compounded by the high degree of compression evident throughout the 'translation') raise the distinct possibility that Macrobius may not have translated directly from the *Timaeus* but perhaps lifted the passage from Porphyry's *Commentary*. In his commentary on Ptolemy's *Harmonics*, Porphyry had observed that, 'We find in common use among the ancients διάστημα used in the sense of λόγος' (*εὑρίσκομεν γὰρ συνήθως παρὰ τοῖς ἀρχαίοις κατὰ τοῦ λόγου τιθέμενον τὸ διάστημα*),[92] and his first example is none other than this very passage: 'for instance,' Porphyry continues, 'in the *Timaeus* by the Divine Plato, who says "the hemiolic, epitritic and epodgoic spaces arose from these links, and he filled up all the epitritics with the epogdoic kind of interval [etc.]"'[93] Macrobius, however, is our only extant testimony to this part of Porphyry's Timaean commentary, so the point must remain speculative. At very least, we can assert that Macrobius' paraphrase is remarkably consistent with Porphyry's own insistence on the distinction between λόγος and διάστημα in his commentary on Ptolemy.

This clean distinction, however, has come at the price of a hypercorrection that introduces still more Aristoxenian material in the Timaean tradition. At 2.1.25, Macrobius analyzes the five fundamental consonances (*symphoniae*) not only according to the Pythagorean tradition (by offering numerical ratios), but also according to Aristoxenian tradition (by breaking the primary consonances into their component intervals):[94]

> symphonia διὰ τεσσάρων constat de duobus tonis et hemitonio ut minutias quae in additamento sunt relinquamus ne difficultatem creemus et fit ex epitrito; διὰ πέντε constat ex tribus tonis et hemitonio et fit de hemiolio; διὰ πασῶν constat de *sex tonis* et fit de du-

[91] More precisely, *hemiolii*, *epitriti*, and *epogdoi* modify an assumed *numeri*, which in Macrobius' usage indicates the proportions 3 : 2, 4 : 3, and 9 : 8. cf. *In Som. Scip.* 1.19.21 (77.9–16): certi, inquit [sc. Ptolemaeus in libris tribus quos de harmonia composuit], sunt numeri per quos inter omnia quae sibi conveniunt iunguntur aptantur fit iugabilis competentia, nec quicquam potest alteri nisi per hos numeros convenire. sunt autem hi epitritus, hemiolius, epogdous, duplaris, triplaris, quadruplus. quae hoc loco interim quasi nomina numerorum accipias volo [. . .].

[92] *In Ptolemei Harm.* 92.12–13.

[93] *In Ptolemei Harm.* 92.13–18: *ὁ γοῦν παρὰ τῷ θειοτάτῳ Πλάτωνι Τίμαιος ‹‹ἡμιολίων›› φησί, ‹‹διαστάσεων καὶ ἐπιτρίτων καὶ ἐπογδόων γενομένων ἐκ τούτων τῶν δεσμῶν, τῷ τοῦ ἐπογδόου διαστήματι τὰ ἐπίτριτα πάντα συνεπληροῦτο, λείπων αὐτῶν ἑκάστου μόριον, τῆς δὲ τοῦ μορίου ταύτης διαστάσεως λειφθείσης ἀριθμοῦ πρὸς ἀριθμὸν ἐλάσσονας ἐχούσης τοὺς ὅρους ς′ καὶ ν′ καὶ σ′ πρὸς γ′ καὶ μ′ καὶ σ′››.*

[94] *In Som. Scip.* 2.1.25 (99.11–18): The consonance of the *diatesseron* consists of two tones and a semitone (provided we leave aside the small fraction (*minutias*) which is added here, lest we complicate matters), and arises from the epitritic; the *diapente* consists of three tones and a semitone, and arises from the hemiolic; the *diapason* consists of *six tones*, and arises from the duple; the *diapason* and *diapente* consists of *nine tones* and a semitone, and arises from the triple; finally, the *disdiapason* contains *twelve tones*, and arises from the quadruple.

> plari, uerum διὰ πασῶν καὶ διὰ πέντε constat ex *nouem tonis* et hemitonio et fit de triplari numero, δίς autem διὰ πασῶν continet *tonos duodecim* et fit ex quadruplo.

The importance of this passage completely escapes Flamant, who otherwise deals well with Macrobian music theory. At the beginning of this passage, Macrobius seems to signal the incongruity of his division of the fourth into two tones and a (real) semitone with the standard Pythagorean line, since he notes that it is not *really* true, as he must, for the moment, ignore the discrepancy (specifically, a half-comma or, in the terminology of Philolaus, a *schisma*) between a Pythagorean minor semitone (256 : 243) and the (Aristoxenian) semitone employed in this context.[95] Hesitations duly noted, he continues headlong with the striking claim that the diapason consists of *six tones*. This is a fundamental Aristoxenian position, which is both mathematically and conceptually at odds with Pythagorean harmonics.[96] as argued by Ptolemy in his *Harmonics*, where he reports Aristoxenus' arguments for the fourth consisting of five semitones (i.e, two tones and a semitone, 1.10) and the octave of six tones (1.11). Ptolemy famously critiques the Aristoxenian position by noting that if six successive tones are constructed 'by means of ratio' (τῷ λόγῳ, i.e., $9^6 : 8^6$), the extreme interval of this construction will differ from the octave (2 : 1) by a ratio approximating 75 : 74 (i.e., the comma, 531,441 : 524,288, also approximated by Boethius as falling between 75 : 74 and 74 : 73).[97] This argument is part of Ptolemy's ongoing critique of the basic Aristoxenian claim that musical intervals can neither be calculated nor represented by numerical ratios. Something akin to this sort of argument must lie behind Macrobius' presentation of the foundational *symphoniae* – for the caveat *ut minutias quae in additamento sunt relinquamus ne difficultatem creemus* can indicate nothing other than the

[95] Cf. *El. har.* 46.3.

[96] William of Conches correctly noted the Aristoxenian orientation of Macrobius' claim, and compares Macrobius' Aristoxenian line with Boethius' Ptolemaic sympathies. *Glos. sup. Macr.*, comment. ad 2.1.25: Hic aperte innuit Macrobius se uelle minutias contineri in diatessaron cum duobus tonis et semitonio minori, et inde habet Aristoxenum auctorem. Vnde uidetur contrarius Boethio qui in Musica nullas uult esse consonantiis minutias, et inde habet Ptolemaeum auctorem (cf. *Inst. mus.* 3.2–4, 5.14). As Alison Peden observes, 'It is interesting that William does not discuss the basic difference in epistemology between Aristoxenus and the Pythagoreans (such as Ptolemy) which Boethius had emphasised' (Alison M. Peden, "Music in Medieval Commentaries on Macrobius," in *Musik- und die Geschichte der Philosophie und Naturwissenschaften im Mittelalter: Fragen zur Wechselwirkung von "musica" und "philosophia" im Mittelalter*, ed. Frank Hentschel, Studien und Texte zur Geistesgeschichte des Mittelalters [Leiden: Brill, 1998], 153). The *Glosae Colonienses* interprets the *minutae* as 'fractions' and suggests that these fractions could be computed in whole numbers provided one employs large enough number, even if those numbers remains a mystery. *Glos. Colonienses sup. Macr.*, comment. ad 2.1.25 (257.8–10): VT MINUTIAS RELINQUAMUS. Habitudo enim semitonii per minutias computatur, nisi aliquis ad numerorum misterium multum ascendat, ut integris inveniatur. Minutias autem propter difficultatem vitamus. Cf. *Glos. Colonienses sup. Macr.*, comment. ad 2.1.20 (256.1–6): quomodo in binario possit dyatessaron et dyapente computari, quas supra diximus ex quaternario et ternario constare? Solutio: quod per minutias omnia illa intervalla computabuntur, et licet propter penuriam numerorum non sint actualiter, tamen proportiones illorum ibi sunt naturaliter, et per minutias computare idem est quod et ad maiorum numerum recurrere.

[97] *Inst. mus.* 3.12.

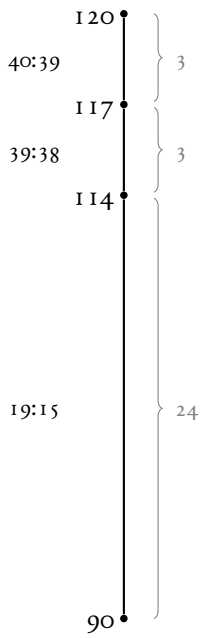
half-comma that separates the Pythagorean fourth from the Aristoxenian fourth (though Aristoxenus is nowhere mentioned by Macrobius). The most likely connection between the two positions is again Porphyry, whom Macrobius is demonstrably following just a few pages later, and who commented on Ptolemy's *Harmonics* and thus engaged as well the Aristoxenian position. Might Porphyry have imported this material into his commentary on the *Timaeus*, which was then abridged by Macrobius, who flattened out (and thus missed the point of) the comparative argument?

1.8 Back to Boethius: conclusions

As I have shown, there is a common thread that runs through our Platonic triptych of Calcidius, Macrobius, and Boethius – namely, the (unacknowledged) importation of a fundamentally Aristoxenian approach to musical 'space' into the context of a distinctly Platonic harmonic theory. Where might this Aristoxenian thread have originated? Barker suggests Eratosthenes,[98] and the Latin texts that I have traversed above seem to offer further confirmation, for Eratosthenes is a common denominator (either directly or indirectly): Calcidius would have known Eratosthenes via Adrastus (and perhaps independently as well); Macrobius' source, Porphyry, directly engages Eratosthenes in his commentary on Ptolemy; and Boethius' source, Nicomachus, explicitly refers to Eratosthenes and Thrasyllus' divisions of the *kanon* in his *Ἁρμονικὸν ἐγχειρίδιον*.[99] Porphyry's observation that the ancients conflated *λόγος* and *διάστημα* is but one important line in a long list of confusions that clearly raised Porphyry's hackles. Eratosthenes, Aelianus, Thrasyllus, and many others are all singled out for their less than systematic usage of *λόγος* and *διάστημα*. His complaint against the famous Hellenistic mathematician and Alexandrian librarian, Eratosthenes, is telling. Though Porphyry concedes that Eratosthenes does not conflate the definition of the two terms, Porphyry still faults Eratosthenes for failing in his usage to 'establish either what he means by *διάστημα* or in what respect it differs from *λόγος*' (*Ἐρατοσθένης μὲν οὖν φησιν ἕτερον εἶναι διάστημα λόγου·* [...] *ἐκ δὴ τοιούτων οὔτε τί καλεῖται διάστημα, οὔτε καθ' ὃ διαφέρει τοῦ λόγου παρέστησεν*).[100]

What occasioned this sound scolding? As Andrew Barker[101] and Stefan Hagel[102] both note

[98] Barker, "Early *Timaeus* Commentaries," 83.
[99] Nic., *Harm.* 260.12–17.
[100] *In Ptolemei Harm.* 91.4–10.
[101] Barker, "Early *Timaeus* Commentaries," 83ff.
[102] Hagel, *Ancient Greek Music: A New Technical History*, 182–187.



Eratosthenes' 'Aristoxenian' quarter-tones,

40:39 and 39:38 = (respectively) 43.83 cents and 44.97 cents,

are nearly identical, differing by only 1.14 cents, well below the threshold of perception.

Figure 1.9: Eratosthenes' enharmonic tetrachord (according to Ptolemy, *Harm.* 3.14).

(though to different conclusions), Eratosthenes seems to have attempted to reconcile Pythagorean ratios with Aristoxenian pitch space, and his reconciliation amounts to nothing other than the same basic principle that we have seen at work in Nicomachus and Boethius, based perhaps on the conflation of λόγος and διάστημα that runs throughout the tradition: the preservation of equal distance as an approximation of equal ratio. According to Ptolemy's *Harmonics* (2.14), Eratosthenes' computation of the enharmonic tetrachord (diagrammed in Fig. 1.9) generated superparticular ratios by exploiting the Aristoxenian principle that the tone is equally divisible into twelve hypothetical units, three of which comprise the enharmonic quarter-tone. Correspondingly, the quarter-tones in Eratosthenes' partition share the common difference of three (120 : 117 and 117 : 114), but not a common ratio.

This is not an isolated example, and several other fragments by Eratosthenes, such as the *Excerpta Neapolitana* (wherein Eratosthenes is credited with dividing the tone into the four quarter-tones:

36 : 35, 35 : 34, 34 : 33, and 33 : 32), demonstrate this same principle. It is difficult to pinpoint precisely what Eratosthenes was actually up to. It is not at all clear, nor is it at all likely, that his Pythagorean translation of Aristoxenian pitch space was as naïve as Ptolemy and Porphyry would have us believe.[103] Nor is it at all clear that the transmitted ratios properly belong to the science of canonics.[104] Nonetheless, it does seem likely that the original (or at least a plausible) context for Eratosthenes' tetrachordal ratios was his lost *Πλατωνικός*, which must have included a discussion of the Timaean world soul (and indeed Eratosthenes' diatonic division is the Timaean division).[105] Thus Eratosthenes' synthetic method is brought into the same Platonic and Timaean realm as the later authors, such as Theon and Nicomachus (among others), who preserve the few surviving *testimonia* to the work of the great Hellenistic mathematician.

In the conclusion to his interpretation of Boethius' 'arithmetical error,' Barbera maintained that, 'although [Boethius'] method of representing the stacking of commas differed in no way from the Aristoxenian method of counting up quarter tones, Boethius seems to have been satisfied by the apparent numerical verification of what he could hear.'[106] I think it unlikely that Boethius heard anything. But Barbera's instincts were fundamentally sound. For as I have argued above, one possible origin of Boethius' arithmetic method lies precisely in a Pythagorean re-interpretation of Aristoxenian quarter-tone stacking — ironically, a very much *non-Pythagorean* method that developed in the service and shadow of Platonic and specifically Timaean harmonics. If we convict Boethius of an 'arch arithmetical crime,' then we must convict Nicomachus, Ptolemy, and Eratosthenes as well. And I hope to have demonstrated that Nicomachus in particular several times exploited the possibilities of arithmetic approximation with a sound methodological footing. Although Boethius' *De institutione musica* stands at a great distance from the mythological realm of Timaeus' 'likely story,' it may still harbor within the nitty-gritty minutiae of its mathematical methods the remnants of a lost, Hellenistic, specifically Timaean musicology.

The arithmetical procedure of *De institutione musica*, 3.14–16 is but one concrete example of the widespread conflation of ratio and interval that arose within the early stages of the Greek commen-

[103] Hagel, *Ancient Greek Music: A New Technical History*, 182–187.
[104] David E. Creese, *The Monochord in Ancient Greek Harmonic Science* (Cambridge: Cambridge University Press, 2010), 179–180.
[105] Barker, "Early *Timaeus* Commentaries," 84; Klaus Geus, *Eratosthenes von Kyrene: Studien zur hellenistischen Kultur- und Wissenschaftsgeschichte* (Munich: C.H. Beck, 2002); Creese, *The Monochord in Ancient Greek Harmonic Science*, 207–208.
[106] Barbera, "Interpreting an Arithmetical Error," 41.

tary tradition on Plato's *Timaeus*. This conflation invited commentators to import Aristoxenian intervallic language into a fundamentally Pythagorean context. By re-assessing harmonic theory in the Timaean commentary tradition via Calcidius, Macrobius, and Boethius, we can see that although each is indebted to the *Timaeus*, each knew different pieces of its commentary tradition: Calcidius via Adrastus, Macrobius via Porphyry, and Boethius via Nicomachus. Determining precisely how these pieces were re-assembled in the twelfth century (often in such a way as to form a new picture of cosmic harmony) is one of the primary goals of the remainder of this study.

CHAPTER TWO

DEFINING THE DOMAIN: MVSICA AND THE DIVISIONES SCIENTIAE

The relationship between music and philosophy has long interested scholars in both disciplines, but neither has dealt substantially or even sufficiently with the nexus of these realms in the twelfth century. Within the field of musicology, the remarkable effort expended upon the post twelfth-century adoption, expansion, and critique of Aristotelian thought in musical discourse,[1] is matched by an equally remarkable neglect of music theory in the period immediately preceding the full integration of Aristotelian vocabulary. In part, this neglect stems from a perceived lack of texts; there are no 'Neoplatonic' musical treatises from the twelfth century comparable in scope to the 'Aristotelian' veneer of, say, the *Ars musicae* of Magister Lambertus or the scholastic *Quaestiones de musica* that have figured prominently in recent scholarship.[2] But the apparent dearth of twelfth-century 'writers on music' lamented by Lawrence Gushee[3] does not reflect the evidence of surviving texts; rather, it is a product of modern disciplinary divisions and musicological expectations. For musical discourse also belongs to the rich cosmological and philosophical traditions of the twelfth century and is particularly important in the commentaries and treatises of the scholars who have frequently been associated with the 'School of Chartres.' The intellectual historians and medieval philosophers who have edited and studied these fundamental texts, however, have several times stumbled over technical music-theoretical terms,[4] sometimes proposed interpretations contradicted by the music-historical record,[5] or, more often than not, granted music only the vague, glancing mention of a Neoplatonic

[1] See, for instance, Dorit Tanay, *Noting Music, Marking Culture: The Intellectual Context of Rhythmic Notation, 1250–1400*, Musicological Studies and Documents 46 (American Institute of Musicology, 1999); Frank Hentschel, *Sinnlichkeit und Vernunft in der mittelalterlichen Musiktheorie: Strategien derKonsonanzwertung und der Gegenstand der* musica sonora *um 1300.*, Beiheft zum Archiv für Musikwissenschaft 47 (Stuttgart: Franz Steiner Verlag, 2000).

[2] E.g., Cecilia Panti, "The First 'Questio' of ms Paris, B.N. lat. 7372: 'Utrum musica sit scientia,'" *Studi medievali* 33 (1992): 265–313; Frank Hentschel and Martin Pickavé, "'Quaestiones mathematicales': Eine Textgattung der Pariser Artistenfakultät in frühen 14. Jahrundert," in *Nach der Verurteilung von 1277: Philosophie und Theologie an der Universität von Parisim letzten Viertel des 13. Jahrhunderts*, ed. Jan A. Aertsen, Jr. Emery Kent, and Andreas Speer (Berlin: Walter de Gruyter, 2001), 618–34; Hentschel, *Sinnlichkeit und Vernunft*, 281–313.

[3] Gushee, "Questions of Genre in Medieval Treatises on Music," 410.

[4] For instance, Haijo Westra, in his edition of the *Commentum in Martianum* attributed to Bernard Silvestris (Westra, *The Comm. on Martianus Capella*, 182), unnecessarily 'emends' the correct and striking hexachordal nomenclature *cefaut* (=C-fa-ut) and *cesolfaut* (=C-sol-fa-ut) to the meaningless *re-fa-ut*. See below, 3.1 (83).

[5] For instance, Charles Burnett misconstrues a twelfth-century gloss on Boethius' *De institutione musica* as evidence of two- or three-line staff notation when it in fact addresses Boethius' modal diagram, see Charles Burnett, "Adelard,

'cosmic harmony.'[6]

As a result of this inattention, some scholars have even gone so far as to claim that the twelfth century witnessed the near complete withdrawal of music from quadrivial studies. The new 'autonomy' of music, confirmed for Guy Beaujouan by a detachment from generalized studies, led (he claims) to the 'eclipse' of Boethius: 'not until the fourteenth century, with the *ars nova*, did music once more become a specialization of masters of arts interested in mathematics [. . . , when] the *De musica* of Boethius was studied with renewed interest.'[7] Hesitations over granting any kind of 'autonomy' to medieval musical practice notwithstanding, the 'withdrawal' of music from quadrivial studies is difficult to reconcile with the expanded scope often granted to music in twelfth-century philosophical and cosmological texts surveyed in this chapter. I do not, however, offer here a comprehensive account of twelfth-century *divisiones philosophiae*[8] but instead sketch in broad strokes the expansion of music's role in quadrivial and natural-philosophical contexts through a limited subset of texts: first, the late-ancient divisions available in the twelfth century; and second, a select group of twelfth-century commentators (primarily Bernard of Chartres, William of Conches, Bernard Silvestris), whose texts offer testimony to the continued and indeed expanded viability and utility of what would later be deemed *musica speculatiua*.

The distinction between *musica speculatiua* and *musica actiua* has long been an organizing principle in discussions of medieval musical thought.[9] This division is largely fictitious. In medieval

Music, and the Quadrivium," in *Adelard of Bath: An English Scientist and Arabist of the Early Twelfth-Century*, ed. Charles Burnett (London: Warburg Institute, 1987), 81.

6 Winthrop Wetherbee, *Platonism and Poetry in the Twelfth Century: The Literary Influence of the School of Chartres* (Princeton: Princeton University Press, 1972) and Brian Stock, *Myth and Science in the Twelfth Century: A Study of Bernard Silvester* (Princeton: Princeton University Press, 1972) are examples of this tendency, e.g., (from the latter) 'The essential components of the renovated Platonic cosmology were mathematical and musical harmony, naturalism, and logical consistency within the cosmic system' (9).

7 Guy Beaujouan, "The Transformation of the Quadrivium," in *Renaissance and Renewal in the Twelfth Century*, ed. Rorbert L. Benson and Giles Constable (Oxford: Oxford University Press, 1982), 465–467, a section entitled 'The secession of music.'

8 The literature is extensive. Several classic studies can still be consulted with profit: J. Mariétan, *Problème de la classification des sciences d'Aristote à St-Thomas* (St-Maurice and Paris: Felix Alcan, 1901); Ludwig Baur, *Dominicus Gundissalinus: De divisione philosophiae*, Beiträge zur Geschichte der Philosophie des Mittelalters, 4.2–3 (Münster: Aschendorff, 1903); Martin Grabmann, *Die Scholastische Methode von ihren ersten Anfängen in der Väterliteratur bis zum Beginn des 12. Jahrhunderts*, vol. 1 of *Die Geschichte der Scholastischen Methode* (Freiburg im Breisgau: Herdersche Verlagshandlung, 1909). On the twelfth century see Franco Alessio, "La filosofia e le *artes mechanicae* nel secolo XII," *Studi medievali* 6 (1965): 69–161; Gilbert Dahan, "Les classifications du savoir aux XIIe et XIIIe siècles," *L'enseignement philosophique* 40 (1990): 5–27.

9 E.g. Gerhard Pietzsch, *Die Klassifikation der Musik von Boethius bis Ugolino von Orvieto*, Studien zur Geschichte der Musiktheorie in Mittelalter 1 (Halle: M. Niemeyer, 1929); Nan Cooke Carpenter, *Music in the Medieval and Renaissance Universities* (Norman: University of Oklahoma Press, 1958); cf. Leo Schrade, "Das propädeutische Ethos in der Musikanschauung des Boethius," *Zeitschrift für Geschichte der Erziehung und des Unterrichts* 20 (1930): 179–215. Lawrence

musical discourse, theory and practice emerge not as neatly distinct epistemological categories, but as messy, overlapping tendencies, ever in flux with changing intellectual contexts. Moreover, the terminological distinction was not articulated until the middle of the twelfth century (in the Latin adaptations and translations of al-Farabi's *Classification of the Sciences*)[10] and did not stabilize until the mid-thirteenth century. In the twelfth-century commentary tradition *musica* is employed without qualification as the music of the medieval schoolroom. It takes its place in the quadrivium alongside arithmetic, geometry and astronomy, and it encompasses two interrelated conceptual realms: (1) the elucidation of the definitions, first principles, and divisions that form the foundations of the science of music; and (2) the extension of more abstract, metaphysical musical concepts (such as *proportio*, *armonia*, *concentus*) beyond the sensual, corporeal realm of sounding music. *Musica* offers neither pedagogical nor practical introduction for the musician (in the modern sense of the term), but a road (one of four, of course) to the study of philosophy. Music's audibility is not the sole or even primary criterion for music's reality. Sounding music is but the imperfect and distorting mirror of the more metaphysical, silent *harmonia*—the macrocosmic harmonies that ensure cosmological perfection and the microcosmic harmonies that govern the moral and physical equilibrium of the body.

2.1 Boethius

The division of philosophy attributed to Boethius has often been synthesized and schematized as in Fig. 2.1.[11] Though the schematic remains correct in its outline, the details of this division are not as

Gushee's "Questions of Genre in Medieval Treatises on Music," though employing more fluid criteria that take into account 'intellectual style, social or institutional function, and musical context' (365–357), nevertheless appeals to an underlying speculative/practical distinction. The most comprehensive discussion of *musica speculatiua* remains Albrecht Riethmüller, "Probleme der spekulativen Musiktheorie im Mittelalter," in *Rezeption des antiken Fachs im Mittelalter*, ed. Frieder Zaminer, Geschichte der Musiktheorie 3 (Darmstadt: Wissenschaftliche Buchgesellschaft, 1990), 163–201.

[10] Primarily the *De diuisione philosophiae* of Dominicus Gundissalinus, the tenth chapter of which classifies music in terms of *theorica* and *practica*. The literal translations of Al-Farabi's treatise by Gundissalinus and Gerard of Cremona promulgated the *speculativa/practica* terminology. See Don Michael Randel, "Al-Farabi and the Role of Arabic Music Theory in the Latin Middle Ages," *Journal of the American Musicological Society* 29 (1976): 173–88; Henry George Farmer, *Al-Farabi's Arabic-Latin Writings on Music*, Collection of Oriental Writers on Music 2 (New York: Hinrichsen Edition, 1965); Muhsin Mahdi, "Science, Philosophy, and Religion in Alfarabi's *Enumeration of the Sciences*," in *The Cultural Context of Medieval Learning: Proceedings of the First International Colloquium on Philosophy, Science, and Theology in the Middle Ages – September 1973*, ed. John Emery Murdoch and Edith Dudley Sylla, Boston Studies in the Philosophy of Science 26 (Boston: D. Reidel, 1975), 113–47. On the *theorica/practica* distinction in general see Guy Beaujouan, "Réflexions sur les rapports entre théorie et pratique au Moyen Age," in *The Cultural Context of Medieval Learning: Proceedings of the First International Colloquium on Philosophy, Science, and Theology in the Middle Ages – September 1973*, ed. John Emery Murdoch and Edith Dudley Sylla, Boston Studies in the Philosophy of Science 26 (Boston: D. Reidel, 1975), 437–484.

[11] E.g. John Magee, "Boethius," in *Cambridge History of Philosophy in Late Antiquity*, ed. Lloyd P. Gerson (Cambridge: Cambridge University Press, 2010); Joseph Dyer, "The Place of Musica in Medieval Classifications of Knowledge," *The*

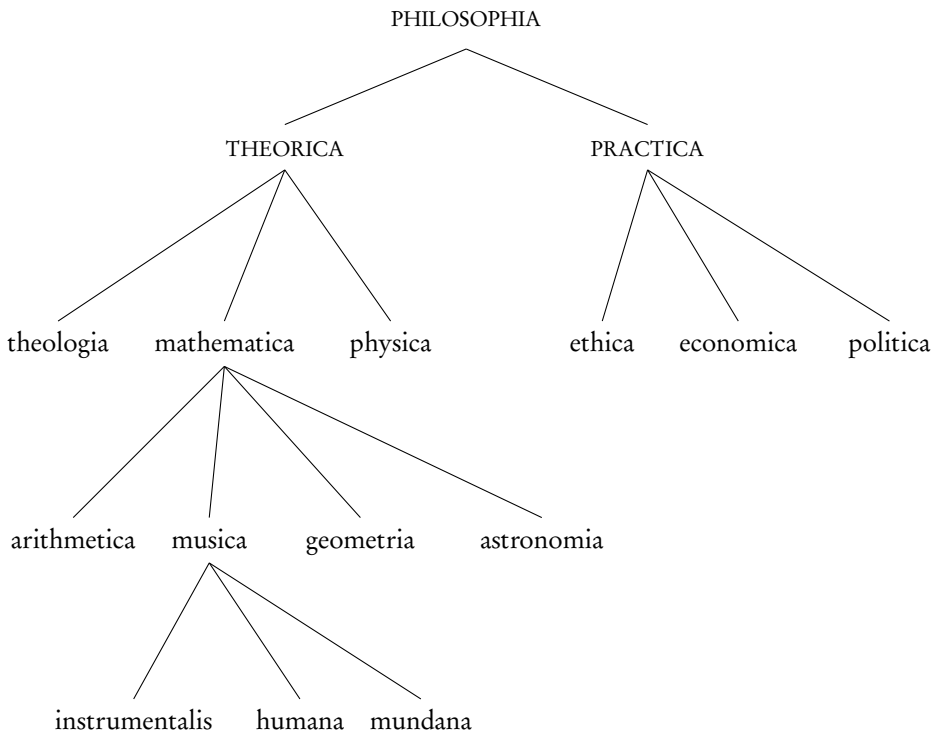


Figure 2.1: divisio philosophiae iuxta Boetium

neatly presented in Boethius' own writing as the schematic might suggest. Its various subdivisions are scattered throughout Boethius' work, and the various sources do not always easily cohere. Since Boethius is the primary source, directly or indirectly, of many of the divisions of philosophy articulated in the twelfth century, it will be necessary to work through, in some detail, the divergent and scattered accounts on which this division rests.

Boethius knows two divisions of philosophy: (1) a bipartite division into *theoretica–practica* allied with the Peripatetic tradition, and (2) a tripartite division into *logica–ethica–physica* associated with Stoic and Academic traditions.[12] To the latter Boethius alludes only three times: twice as a heuristic approach to the Aristotelian corpus;[13] once in the course of presenting the Stoic case for logic as a

Journal of Musicology 24 (2007): 3–71; James A. Weisheipl, "The Nature, Scope, and Classification of the Sciences," in *Science in the Middle Ages*, ed. David C. Lindberg (Chicago: University of Chicago Press, 1978), 461–482.

[12] Both Cicero (*Acad.* 1.5.19) and Augustine (*De ciu. Dei* 8.4) attribute this tripartite division to Plato, an attribution that likely stems from Antiochus of Ascalon. Aristotle seems already to have suggested a similar division at *Top.* 1.14 (105b20off.) On the sources for Augustine's presentation, see Frank Regen, "Zu Augustins Darstellung des Platonismus am Anfang des 8. Buches der *Ciuitas Dei*," in *Platonismus und Christentum. Festschrift für Heinrich Dörrie*, ed. Horst-Dieter Blume and Friedhelm Mann (Münster: Verlag Aschendorff, 1983), 217–218.

[13] *In Cat.* 161b: Haec quoque nobis de decem praedicamentis inspectio, et in physica Aristotelis doctrina, et in moralis philosophiae cognitione perutilis est. *In Perih.* II.79.18–20: ut si quid ex logicae artis subtilitate, ex moralis gravitate

part of philosophy.[14] When, however, Boethius has the *sectio uel diuisio philosophiae* proper in his sights (e.g. *In Isag.* I.8.1ff., *In Isag.* II.140.18–19; cf. *Cons. phil.* 1.p1.4) he is unambiguous. There are two species of philosophy: theoretical and practical.[15] Although the Stoic tripartition is not without utility, it is not Boethius' preferred position, for his primary allegiance, alongside that of Ammonius (e.g. Ammon. *In Isag.* 11.6ff.),[16] lies with the Peripatetic bipartition. But in the prolegomena to his first *Isagoge* commentary, Boethius' first and only full explication of the theoretical–practical divide is idiosyncratic in many of its details. Where Ammonius' initial accounting of practical philosophy (ethics, economics, politics) is concise and direct (*In Isag.* 15.2f.: διαιρεῖται τοίνυν τὸ πρακτικὸν εἰς τε τὸ ἠθικὸν καὶ οἰκονομικὸν καὶ πολιτικόν), Boethius' is periphrastic and oddly ordered (ethics–politics–economics, without further comment).[17] Likewise Ammonius' primary subdivision of theoretical philosophy into theology, mathematics, and physics (*In Isag.* 11.22f.: πάλιν τὸ θεωρητικὸν διαιρεῖται εἰς θεολογικὸν μαθηματικὸν καὶ φυσιολογικόν) is equally concise and closely parallels *Met.* 1026a13–16. But Boethius, after observing that the three branches of theoretical philosophy answer to three levels of being,[18] slides from epistemology to ontology.[19] The objects of theoretical philosophy thus

peritiae, ex naturalis acumine veritatis ab Aristotele conscriptum sit. The inconsistent ordering ([logic]–physics–ethics, logic–ethics–physics) may be symptomatic of Boethius' less than systematic employ of this division; hence, 'heuristic.'

[14] *In Isag.* II.140.18–141.19: iam uero inquiunt: cum in his tribus philosophia uersetur cumque actiuam et speculatiuam considerationem subiecta discernant, quod illa de rerum naturis, haec de moribus quaerit, non dubium est quin logica disciplina a naturali atque morali suae materiae proprietate distincta sit (at II.141.7–12). Cf. Augustine, *De ciu. Dei* 8.4 (cited above).

[15] *In Isag.* I.8.1–2: est enim philosophia genus, *species uero duae*, una quae theoretica dicitur, altera quae practica, id est speculatiua et actiua.

[16] I cannot, however, agree with James A. Weisheipl, "Classification of the Sciences in Medieval Thought," *Mediaeval Studies* 27 (1965): 59 (doubtless under the sway of Courcelle, *Late Latin Writers*) that Boethius was 'following Ammonius' commentary on the same work [*sc.* Porphyry's *Isagoge*].' What evidence there is points away from Ammonius. The theoretical–practical division alone is too general to prove reliance, and the numerous points of divergence between Ammonius' and Boethius' subdivisions cloud attempts to read Boethius' as a crib of Ammonius.' John Magee, *Anicii Manlii Severini Boethii De divisione liber*, Philosophia Antiqua 77 (Leiden: Brill, 1998), xxxvii, fn. 8 cautiously notes that, 'given the quadripartition of mathematical sciences at *Inst. ar.* I 1.4 (cf. *In Isag.* I.9.21f.), the system resembles Ammonius, *In Isag.* 11.6ff..' Since *Inst. ar.* 1.1.4 follows Nicomachus, *Intr. ar.* 1.3 (6.1–7), which Ammonius undoubtledly knew as well, the mathematical division thus can shed little to no light on Boethius' knowledge of Ammonius. Resemblence is the most we can say, and that's not saying very much.

[17] Boet. *In Isag.* I.9.13–21: est enim prima [=ethics] quae sui curam gerens cunctis sese erigit, exornat augetque uirtutibus, nihil in uita admittens quo non gaudeat, nihil faciens paenitendum. secunda [=politics] uero est quae rei publicae curam suscipiens cunctorum saluti suae prouidentiae sollertia et institutiae libra et fortitudinis stabilitate et temperantiae patientia medetur; (3) tertia [=economics] uero, quae familiaris rei officium mediocri componens dispositione distribuit. Ammonius' subdivision of each into legislative and judicial (Ammon. *In Isag.* 15.11–16.4) is passed over by Boethius at *In Isag.* I.9.21f.: sunt harum etiam aliae subdiuisiones, quas nunc persequi supersedendum est. This is the only division of practical philosophy in Boethius' entire corpus.

[18] *In Isag.* I.8.3–5: erunt autem et tot speculatiuae philosophiae species quot sunt res in quibus iustae speculatio considerationis habetur – a direct echo of *Met.* 1004a2: καὶ τοσαῦτα μέρη φιλοσοφίας ἔστιν ὅσαι περ αἱ οὐσίαι.

[19] Cf. Magee, "Boethius," 806: '[Boethius] in effect converts a traditional Peripatetic classification into an ontological hierarchy that reflects a late Platonism of some kind. [...] His analysis targets a hierarchy of things and the mind's (soul's) descent into the world of matter rather than the sciences as such.'

comprise, in order of ontological priority: (1) *intellectibilia* (=θεολογία),[20] (2) *intellegibilia* (=?),[21] (3) *naturalia* (=φυσιολογία).[22] The difficulty here lies in the specification of the second rung. If the parallel with Ammonius were to hold, it should be mathematics or Neoplatonic 'mathematicals,' and if Boethius were to have countenanced the separate subsistence of mathematicals, we would expect to find them here. But he makes no such identification. *Intellegibilia* hover between lower and higher realities: through corporeal contagion (*corporum tactu*: cf. *Cons. phil.* 3.p12.1) they degenerate from *intellectibilia* and become a lower reality; through contemplation of *intellectibilia* they become *beatiora* (*In Isag.* I.9.2–6). And Boethius concludes by noting that the *intellegibilium substantia* rightly holds the medial position since it has the dual role of animating bodies and contemplating the *intellectibilia*.[23] It seems unavoidable that the second rung is more psychology than mathematics, even if it is, in the final analysis, neither.

In *De trin.* 2, where Boethius presents a second division of theoretical philosophy, the criteria for division have changed to accord with the mental abstraction argument of *De trin.* 1.[24] Here, Neoplatonic ontology gives way to a more sober Aristotelian epistemology (cf. *Met.* 1026a13–16) that evinces no direct correlation between objects of knowledge and levels of being. *Naturalis* is *in motu inabstracta*,[25] glossed ἀνυπεξαίρετος; *mathematica* is *sine motu inabstracta*;[26] *theologica* is *sine motu abstracta atque separabilis*.[27] To each of these three Boethius assigns an appropriate methodology. *Naturalia* should treated *rationabiliter*; *mathematica*, *disciplinaliter*; and *theologia*, *intellectualiter*.

[20] 8.13–19: est enim intellectibile quod unum atque idem per se in propria semper diuinitate consistens nullis umquam sensibus, sed sola tantum mente intellectuque capitur. quae res ad speculationem dei atque ad animi incorporalitatem considerationemque uerae philosophiae indagatione componitur: quam partem Graeci θεολογίαν nominant.

[21] 8.19–9.6: secunda uero est pars intellegibilis, quae primam intellectibiliem cogitatione atque intellegentia comprehendit. que est omnium caelestium supernae diuinitatis operum et quicquid sub lunari globo beatiore animo atque puriore substantia ualet et postremo humanarum animarum. quae omnia cum prioris illius intellectibilis substantiae fuissent, corporum tactu ab intellectibilibus ad intellegibilia degenerarunt, ut non magis ipsa intellegantur quam intellegant et intellegentiae puritate tunc beatiora sint, quotiens sese intellectibilibus applicarint.

[22] 9.6–8: tertia theoretices species est que circa corpora atque eorum scientiam cognitionemque uersatur: quae est physiologia, quae naturas corporum passionesque declarat. *Pace* Dyer, "The Place of Musica in Medieval Classifications of Knowledge," 10-11, these subdivisions do not, as he claims, 'correspond to three degrees of abstraction, an Aristotelian principle encountered also in *De trinitate*.' Dyer's article has numerous problems and should be used with care.

[23] *In Isag.* I.9.10–12.

[24] 'At the end of the previous chapter, Boethius has noticed the way in which the mind can separate what is conjoined in reality, and this carries over into the present consideration' (Ralph McInerny, *Boethius and Aquinas* [Washington, D.C.: The Catholic University of America Press, 1990], 124).

[25] *De trin.* 2: naturalis, in motu inabstracta, ἀνυπεξαίρετος (considerat enim corporum formas cum materia, quae a corporibus actu separari non possunt, quae corpora in motu sunt, ut cum terra deorsum ignis sursum fertur, habetque motum forma materiae coniuncta); cf. περὶ ἀχωριστὰ ἀλλ' οὐκ ἀκίνητα, *Met.* 1026a13–14.

[26] *De trin.* 2: mathematica, sine motu inabstracta (haec enim formas corporum speculatur sine materia ac per hoc sine motu, quae formae cum in materia sint, ab his separari non possunt); cf. περὶ ἀκίνητα οὐ χωριστὰ, *Met.* 1026a15.

[27] *De trin.* 2: theologica, sine motu abstracta atque separabilis (nam Dei substantia et materia et motu caret); cf. περὶ χωριστὰ και ἀκίνητα, *Met.* 1026a16.

This second division differs *toto caelo*. Where the first *Isagoge* commentary presented a Platonic ontic descent, *De trin.* 2 offers a (more) Aristotelian epistemic ascent. Where the first division left the middle rung unspecified, the second clearly identifies it with mathematics. And finally, where the *Isagoge* commentary stated that the middle rung (*intelligibilia*) degenerated from the highest ontic category (*intellectibilia*) by *tactu corporum*, thereby implying the underlying bipartition (1) *intellectibilis/intelligibilis* (2) *naturalis*, *De trin.* 2 links the middle rung (*mathematica*) with the lowest epistemic category (*naturalis*) thus suggesting the underlying bipartition (1) *theologica* (2) *mathematica/naturalis*. The tension between the two divisions appears irreducible.[28]

This second division, however, even if it is more Aristotelian in its outline, better accords with Boethius' outlook elsewhere. For instance, when Boethius notes that the different sciences offer differing accounts of one and the same reality,[29] one of his two examples suggests, in accord with Aristotle (*Phys.* 193b21–34; *Met.* 1061a28–b3), that the physicist and mathematician study the same objects but in different ways.[30] It seems then that in his logical and theological writings Boethius espouses an abstractionist approach to mathematics: mathematical objects are considered *qua* separate from matter and motion (*haec* [*sc. mathematica*] *enim formas corporum speculatur sine materia ac per hoc sine motu*), but they are not separate subsistents over and above sensible bodies (*quae formae cum in materia sint, ab his separari non possunt*).[31] Does Boethius hold this same position in his mathematical works?

The 'first fruits' of Boethius' intellectual labors (*laboris mei primitiae*), the *De institutione arithmetica*, is a loose translation of Nicomachus of Gerasa's *Introductio arithmetica*, which Boethius seems to have undertaken early in his career, likely during the same period as the first *Isagoge* commentary.[32] Following Nicomachus and in some ways similar to the first *Isagoge* commentary, Boethius begins his *De institutione arithmetica* with an account of *philosophia* and *sapientia* from the standpoint of on-

[28] Cf. Magee, "Boethius," 806.

[29] *Intr. syll. cat.* 762c: non enim una atque eadem diuersarum ratio disciplinarum, cum sit diuersissimis disciplinis una atque eadem substantia materies.

[30] *Ibid.*: nec eodem modo lineam uel superficiem mathematicus ac physicus tractant. Cf. *Inst. mus.* 1.1 (179.12–14): Rursus cum quis triangulum respicit vel quadratum, facile id quod oculis intuetur agnoscit, sed quaenam quadrati vel trianguli sit natura, a mathematico necesse est petat.

[31] Cf. *In Isag.* II.160.23: duae quippe incorporeorum formae sunt, ut alia praeter corpora esse possint et separata a corporibus in sua incorporalitate perdurent, ut deus, mens, anima, alia uero cum sint incorporea, tamen praeter corpora esse non possint, ut linea uel superficies uel numerus uel singulae qualitates quas tametsi incorporeas esse pronuntiamus, quod tribus spatiis minime distendantur, tamen ita in corporibus sunt, ut ab his diuelli nequeant aut separari aut, si a corporibus separata sint, nullo modo permaneant.

[32] See Magee, "Boethius," 790–796 for a concise summary of scholarship on the dating of Boethius' works.

tology, and he declares that the objects of *sapientia* are *[ea] quae sunt suique inmutabilem substantiam sortiuntur*, which are subject neither to quantitative change (*quae nec intentione crescunt nec retractione minuuntur*), nor to qualitative change (*nec uariationibus permutantur*), nor to substantial change (*sed in propria semper ui suae se naturae subsidiis nixa custodiunt*). These then are: *qualitates, quantitates, formae, magnitudines, paruitates, aequalitates, habitudines, actus, dispositiones, loca, tempora, et quicquid adunatum quodammodo corporibus inuenitur*.[33] While they themselves are incorporeal and immutable, through bodily participation and the contagion of changeable things they necessarily share in bodily, material flux (*participatione uero corporis permutantur et tactu uariabilis rei in uertibilem inconstantiam transeunt*).[34] The similarity of this language to the description of the second ontic category in the first *Isagoge* commentary is striking: both are intermediaries 'degraded' by *tactu corporum* (*In Isag.*) or *tactu uariabilis rei* (*Inst. ar.*); though themselves incorporeal they are incorporated; and *qua* intermediary, they are both a conduit from the lower to the higher, for as Boethius concludes later in the prooemium, the mathematic disciplines are (famously) a quadruuium, *quo his uiandum sit, quibus excellentior animus a nobiscum procreatis sensibus ad intellegentiae certiora perducitur* (1.1 [9.28-10.2]). Hence, in its ontic focus in general, and its Platonic ontology in particular, the *Inst. ar.* is closer to the first *Isagoge* commentary than it is to *De trin.* 2.

Boethius then divides the objects of mathematics into discrete quantity (*multitudo*, *τὸ ποσόν*) and continuous quantity (*magnitudo*, *τὸ πηλίκον*).[35] Each of these has a second bipartition: multitude into *per se* (*καθ' ἑαυτό*) = arithmetic, and *ad aliquid* (*πρὸς ἄλλο*) = music; magnitude into *immobilis* (*ἐν μονῇ καὶ στάσει*) = geometry, and *mobilis* (*ἐν κινήσει καὶ περιφορᾷ*) = astronomy.[36] Hence, arithmetic is the science of multitude in itself, whereas music is the science of multitudes in relation to each other; geometry is the science of immobile magnitudes, but astronomy the science of

[33] *Inst. ar.* 1.1 (7.26–8.11). Cf. *Intr. ar.* 1.1.3 (2.21–3.3): *ποιότητες, ποσότητες, σχηματισμοί, μεγέθη, μικρότητες, ἰσότητες, σχέσεις, ἐνέργειαι, διαθέσεις, τόποι, χρόνοι, πάντα ἁπλῶς, οἷς περιέχεται τὰ ἐν ἑκάστῳ σώματι.* See Dominic J. O'Meara, *Pythagoras Revived: Mathematics and Philosophy in Late Antiquity* (Oxford: Clarendon Press, 1989), 16-18.

[34] Cf. the abridgment of this passage at *Inst. mus.* 2.2 (227.20–228.2): primus omnium Pythagoras sapientiae studium philosophiam nuncupauit, quam scilicet eius rei notitiam ac disciplinam ponebat, quae proprie uereque esse diceretur. Esse autem illa putabat, quae nec intentione crescerent, nec deminutione decrescerent nec ullis accidentibus mutarentur. Haec autem esse formas magnitudines qualitates habitudines ceteraque quae per se speculata inmutabilia sunt, iuncta uero corporibus permutantur et multimodis variationibus mutabilis rei cognatione vertuntur.

[35] *τὸ ποσόν* is a finite multitude, as opposed to the infinite *πλῆθος*; likewise, *τὸ πηλίκον* is a finite magnitude, as opposed to the infinite *μέγεθος*: *Intr. ar.* 1.2.5 (4.20–5.12); cf. Iamblichus, *De comm. math. sc.* 7 (29.22–30.7). Boethius does not (and perhaps could not) make the terminological distinction; *multitudo* and *magnitudo* are the only terms he employs. He compensates, however, by displacing until after the full mathematical division the discussion of finite vs. infinite quantity, excused as a brief addendum (9.13–26: Illud quoque addendum arbitror, etc).

[36] *Inst. ar.* 1.1 (9.1–5) = *Intr. ar.* 1.3.1–2 (6.1–7).

magnitudes in motion. The order is not arbitrary, as the four mathematical sciences are not, strictly speaking, co-ordinate. Rather, they demonstrate a clear order of priority, and this priority takes the tidy form of two parallel priorities – the absolute (arithmetic) is prior to the relative (music) just as stasis (geometry) is prior to motion (astronomy) – nested within the single overarching priority of arithmetic to the other mathematical sciences.[37]

In the prooemium to the *De institutione musica*, the second of his mathematical works and likewise an interpolated translation of a (no longer extant) musical treatise by Nicomachus, Boethius sets out a further division of music: *musica mundana*, *humana*, and *instrumentalis*.[38] *Musica mundana* arises from the harmonic structures and periods of the celestial bodies, from the delicate balance of the four elements, and from the cyclical succession of the seasons.[39] *Musica humana* comprises the harmonic structures governing the human soul, the human body, and the relations between soul and body.[40] And *musica instrumentalis* encompasses the sonorous sounds arising from instruments and voices.[41] It remains uncertain whether Boethius found this division already articulated in Nicomachus or whether it is of his own devising. The little evidence there is suggests the latter, for despite the wide influence of Nicomachus' mathematical works on the commentaries and treatises of the (Greek) Neoplatonists (especially Iamblicus and Proclus), there exists no direct Greek parallel to Boethius' division.[42] Moreover, at *Inst. ar.* 1.2, Boethius lists three numerically based realities in support of the assertion that number was the primary exemplar (*principale exemplar*, παράδειγμα) in the mind of the world's creator: the elements, seasons, and heavenly motions (12.17–19: *hinc enim quattuor elementorum multitudo mutuata est, hinc temporum uices, hinc motus astrorum caelique conuersio*). While this list strongly anticipates the parts of *musica mundana* ennumerated at *Inst. mus.* 1.2 (187.25–26): *in ipso caelo uel compage elementorum uel temporum uarietate*), significantly it has no literal analogue in Nicomachus, for the parallel passage, *Intr. ar.* 1.6.1 (12.11–12), offers the longer

[37] *Inst. ar.* 1.1 (10.8–12.12) = *Intr. ar.* 1.4–5 (9.5–11.23); cf. Dominic J. O'Meara, "The Music of Philosophy in Late Antiquity," in *Philosophy and the Sciences in Antiquity*, ed. R.W. Sharples, Keeling Series in Ancient Philosophy (Aldershot: Ashgate, 2005), 134–135.

[38] *Inst. mus.* 1.2 (187.18–23): Principio igitur de musica disserenti illud interim dicendum uidetur, quot musicae genera ab eius studiosis conprehensa esse nouerimus. Sunt autem tria. Et prima quidem mundana est, secunda uero humana, tertia, quae in quibusdam constituta est instrumentis, ut in cithara uel tibiis ceterisque, quae cantilenae famulantur. Since a full explication of this division and its influence on subsequent music-theoretical traditions forms the heart of this study (see chapters three through five), I here sketch only a brief outline of the division.

[39] *Inst. mus.* 1.2 (187.23–188.26).

[40] *Inst. mus.* 1.2 (188.26–189.5).

[41] *Inst. mus.* 1.2 (189.5–12).

[42] Cf. Bower, "Boethius and Nicomachus," 44–45.

and more generic list, *χρόνος, κίνησις, οὐρανός, ἄστρα, ἐξελιγμοὶ παντοῖοι*.

Such are the divisions and subdivisions scattered throughout Boethius' work, and they are not without problems and contradictions in their synthesis, some of which have already been noted. On one hand, the mathematical divisions cannot easily be subsumed into the theoretical division of the first *Isagoge* commentary, since mathematics has no explicit role in the division. On the other hand, while the mathematical discussions may seem, *prima facie*, to accord with the division of *De trin.* 2 (whose second category is mathematics), there are several attendant contradictions. First, if the theoretical mathematics of *De trin.* considers its objects *sine motu*, how can astronomy as defined in the *Inst. ar.* (*mobilis magnitudo*) be a mathematical, as opposed to physical, science?[43] Second, and more significantly, the prefaces to the mathematical works project a 'seamless continuum between the mathematical sciences and philosophy in all of its other manifestations.'[44] In fact, Nicomachus presents the division of mathematics *as* a division of philosophy, insofar as Pythagoras (in Nicomachus' account) first properly defined *σοφία* as the science of 'true being,' i.e. *ὄντα δὲ τὰ κατὰ τὰ αὐτὰ καὶ ὡσαύτως ἀεί διατελοῦντα ἐν τῷ κόσμῳ καὶ οὐδέποτε τοῦ εἶναι ἐξιστάμενα οὐδὲ ἐπὶ βραχύ*, and he cites in his support *Timaeus* 27d. Boethius, in distilling Nicomachus' first few chapters into his own prooemium, tones down the broader claims and suppresses the Timaean citation, but mathematics clearly still holds a paradigmatic role, and Boethius maintains the strongly Pythagorean commitment to the numerical basis of reality. This latter view rubs uncomfortably against the abstractionist mathematics of the later logical and theological works. Thus the sources do not easily cohere on the division of philosophy: the first *Isagoge* commentary casts a Peripatetic division in distinctly Platonic terms but conspicuously avoids any engagement with the mathematical or numerical realities that might underpin such a world-view; *De trin.* 2, by contrast, maintains a strict Aristotelian division where mathematical objects are fundamentally *inabstracta*, even if they are considered *sine materia ac per hoc sine motu*. Hence, from an ontological standpoint, the mathematical works concord with the first *Isagoge* commentary where mathematics is missing, but they are not easily subsumed within the Aristotelian epistemology of *De trin.* 2, where mathematics is explicitly included.

[43] One solution would be that astronomy is merely an exception, especially since its motions are eternal and unchanging and thus of a different order than the motion (=change) considered by physics; cf. Ammonius *In Isag.* 14.8–10, who draws the distinction between *γνῶσις ποσοῦ συνεθοῦς ἀκινήτου* (geometry) and *γνῶσις ποσοῦ συνεθοῦς ἀεικινήτου* (astronomy).

[44] Magee, "Boethius," 798.

Whether or not Boethius intended for the scattered pieces to be assembled into a coherent, multilevel division, his readers took up the project for themselves. In the twelfth century, scholars used various strategies to bring the pieces into harmony, from selective citation and strategic omission to subtle terminological shifts and bold emendations. Boethius' division, however, was not the only division of philosophy in circulation; the remarks of Martianus, Calcidius, Macrobius, Cassiodorus, and Isidore were brought to bear on the problem as well.

2.2 Martianus Capella

Much remains uncertain about Martianus Minneius Felix Capella's allegorical encyclopedia. Dates proposed for its composition have swung between the fifth century's early and late decades;[45] we know next to nothing about its author save for the work's possible autobiographical glimmers, e.g., *De nuptiis* 1.2 (2.6–7), 6.577 (203.8–11), 9.999–1000 (385.11–386.4); and its original intent and audience remain shrouded in obscurity. One thing can be said with absolute certainty: it is a difficult text. Replete with recondite syntax and *hapax legomena*, it has taxed generations of editors, medieval and modern alike. As early as 534, its first editor, a certain Securus Melior Felix, lamented the corrupt state of the manuscripts,[46] and any emendations that Felix might have provided seem still insufficient, for the proliferation of medieval copies stem from a single Merovingian archetype that itself was still of suspect authority.[47] The complaints of the medieval commentators – *locus iste corruptus scriptorum vitio* noted Remigius[48] – still echo as *locum pro desperato reliqui* in the apparatus of J. Willis' Teubner edition, and even more passages not obelized by Willis may drive readers to despair.[49] The syntactical and lexical difficulty of the *De nuptiis* is not merely a matter of historical curiosity; it is central to

[45] 410–439 remains the *communis opinio*, most recently defended in Jean-Yves Guillaumin, ed. and trans., *Les noces de Philologie et de Mercure. Livre VII. L'arithmétique* (Paris: Belles lettres, 2003); 470s or 480s is argued in Danuta Shanzer, *A Philosophical and Literary Commentary on Martianus Capella's De Nuptiis Philologiae et Mercurii Book 1*, University of California Publications. Classical Studies 32 (Berkeley: University of California, 1986) and Samuel I.B. Barnish, "Martianus Capella and Rome in the Late Fifth Century," *Hermes* 114 (1986): 98–111; as late as 496–523 according to Sabine Grebe, "Gedanken zur Datierung von *De nuptiis Philologiae et Mercurii* des Martianus Capella," *Hermes* 128 (2000): 353–368.

[46] See Alan Cameron, "Martianus and His First Editor," *Classical Philology* 81 (1986): 320–328; Jean Préaux, "Securus Melior Felix, l'ultime Orator Urbis Romae," in *Miscellanea patristica, historica et liturgica Eligio Dekkers O.S.B. XII lustra complenti oblata*, 2 vols. (Bruges: Sint-Pietersabdij, 1975), 2: 101–121.

[47] Willis, *Martianus Capella*, vi; Danuta Shanzer, "Felix Capella: *Minus sensus quam nominis pecudalis*," *Classical Philology* 81 (1986): 62–81.

[48] Cora E. Lutz, ed., *Remigii Autissiodorensis Commentum in Martianum Capellam*, 2 vols. (Leiden: Brill, 1962–1965), 195.17–18.

[49] See the list in Shanzer, "Felix Capella: *Minus sensus quam nominis pecudalis*," 78–79.

one of its most puzzling aspects: how and why did such a formidable text seize the medieval literary imagination and establish itself as one of the most important medieval school-texts, surviving in no less than 244 copies? On one level, as Mariken Teeuwen observes, the 'intricate Latin was seen as a good test case for one's knowledge of the language (on an "expert level"), and a good opportunity to expand one's vocabulary and grammatical skills.'[50] Indeed there are abundant examples of scholars mining the *De nuptiis* for its lexographical riches – the annotations of Rather of Verona (890–974) are one such instance.[51] But Martianus' text was more than just a whetstone for sharpening linguistic competence, and it was as much the *De nuptiis*' allegorical form as its scholastic content that recommended it to its medieval readers.

The *De nuptiis Philologiae et Mercurii* consists of two parts: the first and second books establish a framing allegory, the eponymous marriage of Philology and Mercury, and the seven subsequent books comprise short treatises on the seven liberal arts, diegetically framed as Mercury's wedding gifts. The allegory can be summarized as follows: Mercury has come of age and thus must take a wife (1.3–5). When Sophia, Mantice, and Psyche are all dismissed as unsuitable (1.6–7), Mercury, accompanied by Virtue, looks for advice to his brother Apollo (8–21), who suggests the learned though mortal Philology (22–24). Jupiter and Juno are sought to confirm the betrothal (25–40), and they convene the celestial senate to approve Philology's apotheosis (41–97). Book two opens on earth, as Philology performs arithmological calculations to confirm that her forthcoming marriage is indeed auspicious (2.98–108) and begins to prepare her mortal body for the celestial ascent (109–113). Phronesis, Philology's mother, dresses her appropriately (114–116), and the Muses come to sing her praises (117–130). Philosophy then gives Philology an emetic (131–135), which causes her to vomit forth a stream of writings; the muses and maidens – some called Disciplines, some called Arts – collect the writings, each according to her need (136–138). Philology then drinks from the cup of immortality, described as a cosmic egg (139–140), and after performing other preparatory rites (141–142), she mounts a litter borne aloft by Labor, Epimelia (Application), Agrypnia (Wakefulness), and Periergia (Curiosity) to begin her ascent through the celestial spheres (143–199). Upon arrival at the

[50] Mariken Teeuwen, "The Study of Martianus Capella's *De nuptiis* in the Ninth Century," in *Learned Antiquity: Scholarship and Society in the Near-East, the Greco-Roman World, and the Early Medieval West*, ed. Alasdair A. MacDonald, Michael W. Twomey, and Gerrit J. Reinik, Groningen Studies in Cultural Change 5 (Leuven: Peeters, 2003), 186.

[51] See Claudio Leonardi, "Raterio e Marziano Capella," *Italia Medioevale e Umanistica* 2 (1959): 73–102; Claudio Leonardi, ed., *Notae et glossae autographicae Ratherii Veronensis*, Corpus Christianorum. Continuatio Mediaevalis, 46A (Turnhout: Brepols, 1984); Mariken Teeuwen, "The Vocabulary of Martianus Capella Commentators of the Ninth Century: Some Observations," *Archivum Latinitatis Medii Aevi* 63 (2005): 71–81.

heavens' outermost periphery (200–201), she offers a silent, mystical prayer to *quaedam fontana virgo* and to the *ἄπαξ καὶ δὶς ἐπέκεινα potestates* (the Chaldean hypostases known to Martianus through a Neoplatonic intermediary), before finally approaching the celestial assembly (202–208). As the bridal party draws close, Jupiter summons the groom (209–214), and Philology follows soon after, modestly declining Jupiter's offer of a seat at his right hand and taking her place in the company of Athena (215–216). Phronesis requests that Mercury's wedding gifts be conferred before the full assembly (217—218), and here begins the procession of the seven learned *dotales virgines*: *nunc ergo mythos terminatur; infiunt / artes libelli qui sequentes asserent* (2.220 [57.24–58.1]).

Martianus' liberal arts, however, are not the *sobriae disciplinae*, stripped of fictitious embellishments, promised in the last metrum of book two (2.220 [58.3]), for Martianus' muse protests: *vestiantur Artes* (3.222 [59.7]). The muse has her way, and far from sober, Martianus' arts are loud, boisterous, even comic personifications[52] whose nuptial offerings to the bride take the form of seven orations on the liberal arts, declaimed in the order: grammar, dialectic, rhetoric (later the trivium), geometry, arithmetic, astronomy, and music (later the quadrivium). Accounting for the number and order of Martianus' arts is tricky business, especially since it seems likely that any pre-existent system was modified to suit Martianus' literary purposes, e.g., music comes last to occasion Hymenaeus' epithalamium (9.902–903).[53] But let the classicists worry about Martianus' antecedents. Whether Martianus had before him Varro's lost *Disciplinarum libri*[54] or a later, Porphyrian, Neoplatonic source[55] is immaterial for the later medieval commentators. And regardless of whether Martianus' summary dismissal of medicine and architecture as 'having nothing in common with heaven or the gods' (9.891 [339.5–6]) departs deliberately from Varro's nine-fold scheme[56] or reflects a Middle Platonic unease with their propaedeutic value,[57] the dismissal highlights one important theme that strongly recom-

[52] Lucio Cristante, "*Spectaculo detinemur cum scripta intellegimus aut probamus*. Per un riesame della rappresentazione delle Artes in Marziano Capella," *Incontri triestini di filologia classica* 4 (2005): 375–390.

[53] Ilsetraut Hadot, *Arts libéraux et philosophie dans la pensée antique: contribution à l'histoire de l'éducation et de la culture dans l'Antiquité*, 2nd ed., Texts et traditions (Paris: J. Vrin, 2005), 149.

[54] The traditional opinion upheld most recently by Shanzer, *A Philosophical and Literary Commentary on Martianus Capella's De Nuptiis Philologiae et Mercurii Book 1*; Danuta Shanzer, "Augustine's Disciplines: *Silent diutius Musae Varronis*?" In *Augustine and the Disciplines: From Cassiciacum to Confessions*, ed. Karla Pollman and Mark Vessey (Oxford: Oxford University Press, 2005), 69–112; Muriel Bovey, *Disciplinae cyclicae: l'organisation du savior dans l'œuvre de Martianus Capella*, Polymnia 3 (Trieste: Edizioni Università di Trieste, 2003).

[55] As maintained by Hadot, *Arts libéraux et philosophie dans la pensée antique: contribution à l'histoire de l'éducation et de la culture dans l'Antiquité*.

[56] Shanzer, *A Philosophical and Literary Commentary on Martianus Capella's De Nuptiis Philologiae et Mercurii Book 1*, 15.

[57] Hadot, *Arts libéraux et philosophie dans la pensée antique: contribution à l'histoire de l'éducation et de la culture dans l'Antiquité*, 150.

mended the *De nuptiis* throughout its long reception history: the ascent from the corporeal to the incorporeal, from the terrestrial to the celestial (cf. Aug., *De ord.* 2.5.14, 2.14.39–15.43; *Retr.* 1.6).

This (Neoplatonic) *reditus* is allegorized by Philology's apotheosis in book two, and it remains discernible within the ascent through the individual disciplinae of the seven subsequent books, the quadrivium in particular. The first of the quadrivial maidens, Geometria, whose (notably Grecian) sandals are worn thin from her globetrotting (6.581), offers primarily a compendium of terrestrial geography. Geometry's closest sister, the second maiden Arithmetica, introduces herself to the assembly by requesting that Jupiter himself acknowledge her as the 'source of his own unique and originary nature' (7.730 [262.7–8]), as indeed the mother of the entire celestial throng. The third maiden, Astronomia, appears enclosed in a globe of ethereal light (9.810), and her numinous presence startles the lesser deities of the aerial, terrestrial, marine, and subterranean realms. Finally Harmonia, the last maiden, enters the celestial senate to the melodious strains of the *musica caelestis*, and all stand in reverence and awe of the extramundane intelligence (9.910, cf. 2.202), a gesture of respect accorded Harmonia alone. The Christianization of this avowedly pagan, Neoplatonic ascent, and its implications for the arrangement and purpose of the liberal arts, remained a primary theme throughout the commentary tradition.

2.3 Calcidius and Macrobius

Calcidius knows both the Stoic and Peripatetic divisions, alluding to the former in his discussion of fate (*In Tim.* 148 [185.4–5]: *quippe de hoc* [sc. *fato*] *plurimae disceptationes habentur morales naturales logicae*) and presenting the latter, rendered as *consideratio* (= θεωρητική) and *actus* (= πρακτική), in his discussion of *uisus* (*In Tim.* 264 [269.23–27.14]). But here too the status of mathematics and number within the Peripatetic division is only articulated circuitously:[58]

[58] *In Tim.* 264 (269.23–27.14): Duplex namque totius philosophiae spectatur officium, consideratio et item actus, consideratio quidem ob assiduam contemplationem rerum diuinarum et immortalium nominata, actus uero, qui iuxta rationabilis animae deliberationem progreditur in tuendis conseruandisque rebus mortalibus. Utrique autem officiorum generi uisus est necessarius, ac primum considerationi. Diuiditur porro haec trifariam, in theologian et item naturae sciscitationem praestandaeque etiam rationis scientiam. Neque enim quisquam deum quaereret aut ad pietatem aspiraret, quod est theologiae proprium, nec uero id ipsum quod nunc agimus agendum putaret nisi prius caelo sideribusque uisis et amore nutrito sciendi rerum causas, eorum etiam, quae ortum habent temporarium, exordia; haec quippe demum ad naturalem pertinent quaestionem. Quid quod dierum et noctium uice considerata menses et anni et horarum curricula dinumerata sunt numerique ortus et genitura dimensionis intro data? Quod ad tertiam partem philosophiae pertinere perspicuum est.

> The whole of philosophy has a twofold occupation: *consideratio* and *actus*. *Consideratio* is so named because of its ceaseless contemplation of divine and immortal matters; *actus*, on the other hand, is so named because, in accord with the deliberation of the rational soul, it proceeds in overseeing and observing human affairs. Sight, though necessary for both, has particular import for *consideratio*, which is divided three ways: into (1) theology, (2) the inquiry into nature, and (3) the science of offering an account (*praestandae rationis scientiam*). No one would ever seek God or aspire to piety (a matter proper to theology), nor would he even think to do what we are now doing, unless he should first begin by observing the heavens and stars and by nourishing a love for investigating the causes of things, even those things which have a temporal origin (for precisely these matters pertain to natural questions). And what about the fact that months, years, and the progression of hours are reckoned by considering the alternation of day and night, and that this has given rise to number and measure? This clearly pertains to the third part of philosophy.

Because Calcidius here has his eye squarely on the *laus uiuendi*[59] and is primarily concerned with the priority of *uisus* as a conduit to philosophy in all of its manifestations, the descriptions of the three subdivisions of theoretical philosophy closely adhere to the logic of *Tim.* 46e6ff., and the clarity of the passage *qua* a coherent division of philosophy suffers as a consequence.[60] Thus the description of mathematics, nowhere named as such but only as the *scientia rationis praebendae*,[61] deliberately recalls Plato's assertion of mathematics' natural origin (*Tim.* 47a4–6): *ἡμέρα τε καὶ νὺξ ὀφθεῖσαι μῆνές τε καὶ ἐνιαυτῶν περίοδοι [καὶ ἰσημερίαι καὶ τροπαὶ] μεμηχάνηνται μὲν ἀριθμόν* ('the sight of day and night, months and cycling years [equinoxes and solstices,] has created number').[62] Because of its oblique presentation, Calcidius' third subdivision, the *scientia rationis praebendae*, engendered more than a little confusion about its proper domain and objects.[63]

Macrobius, writing perhaps a century after Calcidius, brings his *Commentarii in Somnium Scipionis* to a rousing conclusion through the affirmation that (2.17.17) 'there is nothing more complete

[59] As the contents list deems this chapter (*In Tim.* 7 [60.5–618]).

[60] So much so that it is difficult to pinpoint Calcidius' source here; Waszink cautiously notes Albinus' *Epitome*, 3 (aka Alcinous' *Didaskalikos*). Indeed something like Alcinous' *διττοῦ δ' ὄντος τοῦ Βίου, τοῦ μὲν θεωρητικοῦ, τοῦ δὲ πρακτικοῦ* (*Didask.* 2 [152.30–31]) may underline Calcidius' *consideratio–actus* distinction; e.g., compare *consideratio quidem ob assiduam contemplationem rerum diuinarum et immortalium nominata, actus uero, qui iuxta rationabilis animae deliberationem progreditur in tuendis conseruandisque rebus mortalibus* against Alcinous (*Didask.* 2 [153.3–5]), *ἔστι τοίνυν ἡ θεωρία ἐνέργεια τοῦ νοῦ νοοῦντος τὰ νοητά, ἡ δὲ πρᾶξις ψυχῆς λογικῆς ἐνέργεια διὰ σώματος γινομένη*; cf. also the similar order theology–physics–mathematics (*Didask.* 3 [153.45–154.5]) as against the Aristotelian order physics–mathematics–theology. See Dillon, *Alcinous. The Handbook of Platonism*, 53–60.

[61] cf. the similar terminology for the mathematical sciences found elsewhere in the commentary: *artificiosa ratio* (1 [57.3]; 119 [164.6–7]; 185 [211.19–20]) and *artificialia remedia* (*In Tim.* 2 [58.6]), as rightly noted in Reydams-Schils, "Calcidius," 499. Claudio Moreschini translates this third branch of *consideratio* as 'dialettica' ('Questa si divide poi in tre parti, teologia, fisica e dialettica') and notes Arist. *Met.* 1025b3ff. as a parallel (Claudio Moreschini, trans., *Calcidio. Commentario al "Timeo" di Platone. Testo latino a fronte*, Bompiani Il Pensiero Occidentale [Milan: Bompiani, 2003], 547).

[62] Calcidius' translation of this passage (which he knew without *καὶ ἰσημερίαι καὶ τροπαὶ*) confirms the intended reference: At nunc diei noctisque insinuata nobis alterna uice menses annorumque obitus et anfractus nati sunt eorumque ipsorum dinumeratio et ex dinumeratione perfectus et absolutus extitit numerus (44.7–9).

[63] See below, 2.5 (p. 63).

than this work, which wholly and completely contains the entirety of philosophy' (*vere igitur pronuntiandum est nihil hoc opere perfectius, quo universa philosophiae continetur integritas*). This entirety encompasses three parts (i.e., the Stoic division): *moralis*, *naturalis*, and *rationalis* (2.17.15). It is to *naturalis* that Macrobius explicitly assigns the task of 'revealing the secret of celestial harmony' (*cum … harmoniae superum pandit arcanum, physicae secreta commemorat*), a position which some twelfth-century commentators will echo. But Macrobius' definition of *rationalis philosophia* will find few adherents. Far from defining rational philosophy in terms of logic and rhetoric (as was traditional), Macrobius assigns it instead to the task of unraveling 'the motion and immortality of the soul, in which there is clearly nothing corporeal, and whose essence not sense perception but only reason can comprehend' (2.17.16); in the twelfth century, however, most commentators (even commentators on Macrobius himself) will assign questions of the soul and other incorporeals to the realm of theology, the highest theoretical science in the Aristotelian bipartition.

2.4 Cassiodorus and Isidore

The Peripatetic division of philosophy in the *Institutiones* of M. Aurelius Cassiodorus is comparatively straightforward. At the beginning of his chapter *De dialectica*, Cassiodorus remarks that it is traditional to include a division of philosophy amongst the prolegomena to an exposition of Porphyry's *Isagoge*.[64] Though he doubtless knew Boethius' translation and commentaries on the *Isagoge*,[65] the terminology and presentation of Cassiodorus' division suggests a closer connection, in some respects, to Ammonius' Porphyry commentary (or, more likely, another commentary within the same tradition).[66] Philosophy divides into *inspectiua* (= θεωρητική) and *actualis* (= πρακτική); these divide respectively into *naturalis–doctrinalis–diuina* and *moralis–dispensatiua–ciuilis*. Of the three theoretical sciences, *doctrinalis* (a literal rendering of μαθηματική) bears the expected subdivision into *arithmetica–musica–geometria–astronomia*, enumerated in their Nicomachean order and with similar criteria for division (*quantitas secundum se*, *numerus ad aliquid*, *magnitudo immobilis*

[64] PL 70, 1168B: Consuetudo itaque est doctoribus philosophiae, antequam ad Isagogen veniant exponendam, divisionem philosophiae paucis attingere: quam nos quoque servantes, praesenti tempore non immerito credimus intimandam.
[65] Cf. PL 70, 1202D-1203A: Isagogen transtulit patricius Boetius, commenta eius gemina derelinquens.
[66] Cf. Courcelle, *Late Latin Writers*, 343.

– only astronomy lacks the Nicomachean specification of *magnitudo mobilis* and is described periphrastically as the *disciplina quae cursus coelestium siderumque figuras contemplatur omnes*).[67]

There are two notable points of contrast with Boethius' account of the mathematical sciences, music in particular. First, whereas Boethius, presumably following Aristotle, had defined mathematics as dealing with *inabstracta sine motu*, Cassiodorus specifies that mathematics deals with *abstracta quantitas*, which has been mentally separated from matter or from other accidents.[68] Second, Cassiodorus' thrice repeated definition of *musica* (1168D, 1203C, 1209B) is more restricted than is Boethius', insofar as Cassiodorus specifies that music is the *disciplina quae de numeris loquitur, qui ad aliquid sunt his qui inueniuntur in sonis*, a claim that accords with the similarly restricted definition in his *Expositio Psalmorum* (97.219–21): *musica est disciplina quae rerum sibi congruentium id est sonorum differentias et conuenientias perscrutatur*. This restriction of *musica* to number 'insofar as it relates to sounds' seems to be Cassiodorus' own intervention upon his source(s). Finally, while Cassiodorus situates music squarely among the mathematical sciences and his chapter on music begins with a discussion that echoes Boethius' categories of *musica humana*[69] and *mundana*,[70] his subsequent technical exposition knows nothing of Boethius' *De institutione musica*.[71] and in fact owes more to the Aristoxenian tradition than it does to Pythagorean mathematics. Two of Cassiodorus' sources, Gaudentius (via the now lost translation by an otherwise unknown Mutianus) and Alypius, bear marked affinities with the Aristoxenian tradition, and Cassiodorus' primary division of music into *armonica*,

[67] PL 70, 1168D–1169A: Arithmetica est disciplina quantitatis numerabilis secundum se. Musica est disciplina quae de numeris loquitur, qui ad aliquid sunt his qui inueniuntur in sonis. Geometrica est disciplina magnitudinis immobilis et formarum. Astronomia est disciplina quae cursus coelestium siderumque figuras contemplatur omnes, et habitudines stellarum circa se et circa terram indagabili ratione percurrit. Here Cassiodorus departs from Ammonius, who explains the four mathematical sciences in the order geometry–astronomy–arithmetic–astronomy (*In Isag.* 14.8–22). Cassiodorus knew of two translations of Nicomachus' *Intro. ar.*, the translation by Boethius and a (now lost) translation by Apuleius. PL 70, 1208B: . . . arithmetica disciplina, quam apud Graecos Nicomachus diligenter exposuit. Hunc primum Madaurensis Apuleius, deinde magnificus uir Boetius Latino sermone translatum Romanis contulit lectitandum.

[68] PL 70, 1168D: Doctrinalis dicitur scientia, quae *abstractam* considerat quantitatem. *Abstracta* enim quantitas dicitur, quam intellectu a materia separantes vel ab aliis accidentibus, ut est, par, impar vel alia huiuscemodi, in sola ratiocinatione tractamus.

[69] 1209A: quidquid enim loquimur, uel intrinsecus uenarum pulsibus commouemur, per musicos rhythmos harmoniae uirtutibus probatur esse sociatum. Musica quippe est scientia bene modulandi; quod si nos bona conuersatione tractemus, tali disciplinae probamur semper esse sociati.

[70] 1209A: coelum quoque terram, uel omnia quae in eis dispensatione superna peraguntur, non sunt sine musica disciplina, cum Pythagoras hunc mundum per musicam conditum et gubernari posse testetur.

[71] Cassiodorus certainly knew that Boethius was an authority on musical matters (cf. *Variae* 2.41, 2.46), but the *Inst. mus.* is not cited in the *Institutiones*, and there is no direct evidence that would place the work in Cassiodorus' library, either in Rome or at Vivarium.

rhythmica, and *metrica*[72] is ultimately Aristoxenian in origin.[73]

The great encyclopedic work of Isidore of Seville, the *Etymologiarum liber*, adds little to the divisions already discussed. In line with Cassiodorus and Boethius, Isidore prefaces his compendium of dialectic with the definition and division of philosophy (2.24), which he too presents according to both the Stoic tripartition[74] (via Augustine) and Peripatetic bipartition (via Cassiadorus, specifically, an abbreviated recension of the *Institutiones*, which was similar to the later *Breviarium Pauli* compiled by Paul the Deacon at Montecassino).[75] Within the Stoic classification, physics is further subdivided into the mathematical sciences, which Isidore attributes to Plato and lists in the distinctive order: arithmetic, geometry, music, astronomy.[76] The Peripatetic division (2.24.10–14) closely follows Cassiodorus (though again music is generally presented as the third of the mathematic sciences), as do the definition of music at the outset of book three (*musica est disciplina quae de numeris loquitur qui inueniuntur in sonis*) and the subsequent tripartition of music into harmonics, rhythmics, and metrics (3.18). Isidore follows this, however, with a second threefold division, perhaps Varronian in origin, derived from Augustine:[77] *ad omnem autem sonum quae materies cantilenarum est triformem constat esse naturam*. This 'material' division encompasses *harmonica* (vocal music), *organica* (music from wind instruments), and *metrica* (music from plucked or struck instruments) – that is to say, music as one of the *beaux-arts* and not as a reflection of a number-based metaphysics.

The final section of the chapter (3.22), however, abruptly returns in force to a fundamentally Pythagorean view that neatly encapsulates (though certainly not from any direct contact) the Boethian categories of *musica instrumentalis*, *humana* and *mundana*:[78]

[72] Cf. *Exp. Ps.* 80.97–102: Est enim disciplinae ipsius magna uis delectabilisque cognitio, quam doctores saecularium litterarum … fecerunt doctrinabili lectione cognosci, quam in rerum natura prius tenebantur abscondita. Prima ergo huius disciplinae partitio est harmonica, rhythmica, metrica.

[73] Cf. Aristoxenus, *El. har.* 32.7; Alypius, *Introd. mus.* 364.7; Aristides Quintilianus, *De mus.* 1.5.

[74] 2.24.3: Philosophiae species tripertita est: una naturalis, quae Graece physica appellatur, in qua de naturae inquisitione disseritur; altera moralis, quae Graece ethica dicitur, in qua de moribus agitur; tertia rationalis, quae Graeco uocabulo logica appellatur, in qua disputatur quemadmodum in rerum causis uel uitae moribus ueritas ipsa quaeratur.

[75] See Louis Holtz, "Quelques aspects de la tradition et de la diffusion des *Institutiones*," in *Atti di settimana di studi su Flavio Magno Aurelio Cassiodoro (Cosenza-Squillace, 19–24 settembre 1983)*, ed. Sandro Leanza (Soveria Mannelli [CZ]: Rubbettino, 1986), 281–312.

[76] On which, see Jean-Yves Guillaumin and Giovanni Gasparotto, eds. and trans., *Isidor. Étymologies, livre 3 (la mathématique)*, Auteurs latins du moyen âge (Paris: Belles lettres, 2009), xvi–xviii.

[77] *De doct. christ*. 2.17.27: facile erat animadvertere omnem sonum, quae materies cantilenarum est, triformem esse natura (this division, moreover, is embedded within an explicitly Varronian context, namely, Varro's tale of the origin of the nine muses). Cf. *In psalm.* 150.7; *De ord*. 2.14.39; see Jacques Fontaine, *Isidore de Séville et la culture classique dans l'Espagne wisigothique*, 2 vols. (Paris: Études augustiniennes, 1959), 426ff.

[78] Numeros autem secundum musicam ita quaeris. Positis extremis, utputa VI et decas dipondius, uides quot monadibus superetur VI a XII, et est VI monadibus: ducis per quadratum, sexies seni faciunt XXXVI. Coniungis extrema illa prima,

> You can find numbers in a harmonic [proportion] as follows.[79] Starting from the numbers at the two extremes [of the proportion], suppose for example six and twelve, determine by how many units six is exceeded by twelve. The answer is six units. Square this answer, and six times six yields thirty-six. Add together the two extremes that we first supposed, and six plus twelve yields eighteen. Divide thirty-six by eighteen, and the answer is two. Add two to the lesser sum, namely six, and this will yield eight. Eight will be the [harmonic] mean between six and twelve. Wherefore eight surpasses six by two [units], which is the third part of six, and eight is surpassed by twelve by four units, which is the third part [of twelve]. Thus by that part by which [the mean] surpasses [the lower limit], [the mean] is surpassed by that same [part of the upper limit]. But just as this same arrangement[80] exists in the universe from the revolutions of the planetary spheres, so also it has so much force (beyond just voices) in the microcosm that without its perfection no man who lacks such harmonies could exist. Metres too exist from the perfection of this same musical [ratio] in arsis and thesis, that is in the elevation and depression [of the voice].

Though he does not signal it as such, Isidore abbreviates here the formulation of *Timaeus* 36a: *τὴν [μεσότητην] μὲν ταὐτῷ μέρει τῶν ἄκρων αὐτῶν ὑπερέχουσαν καὶ ὑπερεχομένην*. Moreover, the derivation of the harmonic mean between six and twelve closely approximates the method and language of Theon of Smyrna's calculation of the same in his *Expositio* 1.61.[81] The importance of this passage for the later tradition, however, lies not in the words themselves, but in the various diagrams (many of which exhibit close parallels with diagrams in the Greek manuscripts of Theon's *Expositio* and other Platonic scholia) that arose as a kind of commentary upon this oblique text, which carries with it weighty Platonic presuppositions.[82]

VI ad XII simul efficiunt XVIII. Partiris tricies sexies per XVIII, efficitur dipondius. Hos iungis cum summa minore, id est sexies, erunt VIII et erit medium inter VI et XII. Quapropter VIII superant VI duabus monadibus, id est tertia de VI, et superantur VIII a XII quattuor monadibus, tertia portione. Qua parte ergo superat, eadem superatur. Sed haec ratio quemadmodum in mundo est ex uolubilitate circulorum, ita et in microcosmo in tantum praeter uocem ualet, ut sine ipsius perfectione etiam homo symphoniis carens non consistat. Eiusdem musicae perfectione etiam metra consistunt in arsi et thesi, id est eleuatione et positione.

[79] Cf. 3.13 (De numeris geometriae): Numeros autem secundum geometriam ita quaeris.

[80] perhaps 'proportion': Isidore's use here of *ratio* may be symptomatic of a conflation of ratio and proportion, but at 3.8.1 (the outline of the arithmetic, geometric, and harmonic proportions) the language is more precise: the arithmetic proportion is deemed (properly) the *analogicum arithmeticae*.

[81] Both points are noted in Guillaumin and Gasparotto, *Isidor. Étymologies, livre 3 (la mathématique), notae ad hunc locum*.

[82] The Isidorian diagrams are poorly served by Guillaumin's new edition. His edition on this point must be corrected by Michel Huglo, "Les diagrammes d'harmonique interpolés dans les manuscrits de la *Musica Isidori*," *Scriptorium* 48 (1994): 171–86; Michel Huglo, "Die Interpolationen von Texten und Diagrammen in der *Musica Isidori*," in *Quellen und Studien zur Musiktheorie des Mittelalters III*, ed. Michael Bernhard, Veröffentlichung der Musikhistorischen Kommission 15 (Munich: Bayerische Akademie der Wissenschaften, 2001), 1–17; Michel Huglo, "The Diagrams Interpolated in the *Musica Isidori* and the Scale of the Old Spanish Chant," in *Western Plainchant in the First Millennium. Studies in the Medieval Liturgy and its Music*, ed. Sean Gallagher et al. (Aldershot: Ashgate, 2003), 243–260; Michel Huglo, "The *Musica Isidori* Tradition in the Iberian Peninsula," in *Hispania vetus. Musical-Liturgical Manuscripts from Wisigothic Origins to the Franco-Roman Transition (9th – 12th Centuries)*, ed. Susana Zapke (Madrid: Fundación BBVA, 2007), 61–92, as well as his review of Guillaumin's edition forthcoming in *Speculum* (and I thank Prof. Huglo for sharing with me a draft of his review).

2.5 Bernard of Chartes and the *Glosae Colonienses super Macrobium*

In the accessus to his *Glosae super Platonem*,[83] Bernard considers the part(s) of philosophy to which the *Timaeus* properly belongs. From the various guises in which Plato presents his primary subject matter (*naturalis iustitia*), Bernard surmises that the dialogue, not surprisingly, encompasses all *three* parts of philosophy: ethics, logic, and physics.[84] That is to say, Bernard subscribes to the Academic-Stoic tripartition (cf. 6.165–66).[85] This division, as is clear from its discussion above, is commonplace enough, but Bernard may have consciously chosen to employ it because of Augustine's (and Isidore's) insistence that the division was genuinely Platonic in origin.[86] Later in the *Glosae* (at 7.377–838, commenting upon *Tim.* 47a), Bernard deploys the idiosyncratic Calcidian version of the Peripatetic bipartition: *consideratio* and *actus*.[87] There Bernard seems to divide theoretical philosophy into theology, physics, and logic (*consideratio in tria diuiditur, in theologiam, phisicam, logicam*), and his editor, Paul Dutton, takes him at his word.[88] Bernard is clearly grasping here for a term with which to define Calcidius' nebulous third category, and *logica* (presumably intended to encapsulate Calcidius' periphrastic *scientia rationis praebendae*) seems a poor fit, as the burden of Bernard's *logica* is the consideration *de rationabili ordinatione tum aliorum, tum temporum* (7.382–383). This is further fleshed out, though by no means clarified, when Bernard comments on the letter of the text:[89]

[83] Bernard's authorship, as argued by Paul Edward Dutton, "The Uncovering of the *Glosae super Platonem* of Bernard of Chartres," *Mediaeval Studies* 46 (1984): 192–221 and Dutton, *The* Glosae super Platonem *of Bernard of Chartres*, has faced serious challanges from Peter Dronke, "Introduction," in *A History of Twelfth-Century Western Philosophy*, ed. Peter Dronke (Cambridge: Cambridge University Press, 1988), 14–17, Sten Ebbesen, "Review of Dutton, *The Glosae super Platonem of Bernard of Chartres*," *Speculum* 71 (1996): 123–125, Caiazzo, *Glosae Colonienses super Macrobium*, 132–141, and most recently Dronke, *The Spell of Calcidius: Platonic Concepts and Images in the Medieval West*. Although these arguments usefully highlight moments in the text where Bernard is less original than Dutton had supposed, they do not decisively disprove authorship. Even Dronke's suggestion that the glosses 'reflect pre-twelfth-century Platonic discussions,' for which he offers no evidence, does not necessarily deny Bernard's authorship as a consequence. William of Conches' *Glosae super Priscianum* is likewise reflects pre-twelfth-century grammatical discussions.

[84] *Bernardi Glos. sup. Tim.* 1.56–60: Supponitur uero ethicae, secundum quod de naturali iusticia uel de ordinatione rei publicae agit. Respicit logicam, cum per aliorum sententias suas firmat rationem. Ad phisicam tendit, cum de planis figuris et solidis corporibus, de incorporatione animae mundi et aliarum earumque motu perpetuo, de stellarum discursibus ratis et errantibus loquitur.

[85] Bernard is followed in this by his students, Gilbert of Poitiers and John of Salisbury.

[86] As noted by Dutton, *The* Glosae super Platonem *of Bernard of Chartres*, 63.

[87] See above, 2.3 (p. 57).

[88] Dutton, *The* Glosae super Platonem *of Bernard of Chartres*, 63.

[89] *Bernardi Glos. sup. Tim.* 7.402–6: AND OF DAY. Here [Plato] teaches that sight is useful for the system of organization, which consists in logic. This is what Plato says: WITH THE MUTUAL ALTERNATION OF DAY AND NIGHT REVEALED TO US through sight, MONTHS ARISE, as well as other measurements of time, and we gain a MEASUREMENT OF THESE times through sight, AND OUT OF THIS MEASUREMENT [ARISES] PERFECT NUMBER, such as the cosmic year and the like.

> AC DIEI. Hic docet quod uisus ualeat ad rationem ordinationis, quae est in logica. Et hoc est: DIEI ET NOCTIS INSINVATA NOBIS, per uisus, ALTERNA VICE NATI SVNT MENSES, et alia tempora, et existit nobis DINVMERATIO EORVM temporum per uisum, ET EX DINVMERATIONE PERFECTVS NUMERVS, ut annus mundanus et similia.

How this *ratio ordinationis* relates to *logica* in its standard formulation[90] remains oblique (to say the least). Bernard here is simply following Calcidius' lead: the *laus uidendi* once again trumps the *diuisio philosophiae*. This passage, in short, is too single minded to provide support for interpreting this division as an intentional, novel hybrid of the Stoic and Peripatetic division, as argued by Andreas Speer, who goes so far as to deem the division 'ein für das 12. Jahrhundert charakteristisches Mischmodell.'[91] Far from being 'charakteristisch,' this *ad hoc* division is unique enough to pinpoint Bernard as the source for all its other attestations, including its apperance in several glossed copies of the *Timaeus*.[92] By far the most interesting use of this division arises not in a Timaean commentary but in an early twelfth-century commentary on Macrobius' *Commentarii in Somnium Scipionis*, the *Glosae Colonienses super Macrobium* recently edited by Irene Caiazzo (2002). This anonymous commentator, commenting upon 1.1.4, saw in Macrobius' phrase, *rerum omnium Plato et actuum naturam penitus inspiciens*, an oblique reference to the division of philosophy: *natura rerum* implies *contemplatio* and *natura actuum* implies *ethica*. While William of Conches in his *Glosae super Macrobium* connects this passage to the standard Peripatetic division,[93] the author of the *Glosae Colonienses* turns instead to Calcidius:[94] *Calcidius sic dividit philosophiam. Philosophia dividitur in contemplationem et actionem. Contemplatio III habet partes: theologiam, phisicam, loicam.* As Caiazzo observes,[95] the commentator's version of the Calcidian division is very close to Bernard's – close enough, in fact, to

[90] It even strains Bernard's own description of the Timaean employ of logic (at 1.57–58): Respicit [sc. liber Platonis] logicam, cum per aliorum sententias suas firmat rationes.

[91] Andreas Speer, "*Scientia quadruvii*: *Musica* in den 'Timaios'-Kommentaren des 12. Jahrunderts," in *Musik- und die Geschichte der Philosophie und Naturwissenschaften im Mittelalter: Fragen zur Wechselwirkung von "musica" und "philosophia" im Mittelalter*, ed. Frank Hentschel, Studien und Texte zur Geistesgeschichte des Mittelalters (Leiden: Brill, 1998), 11.

[92] e.g., Leipzig, Universitätsbibliothek Lat. 1258, f. 6vb (lemmatic commentary) (Dutton, *The* Glosae super Platonem *of Bernard of Chartres*, 257, Appendix 3.1); El Escorial, Biblioteca del real monasterio de San Lorenzo, S. III.05, f. 138r (as noted in Caiazzo, *Glosae Colonienses super Macrobium*, 118); London, British Library, Royal 12.B.XXII, f. 39r (Dutton, *The* Glosae super Platonem *of Bernard of Chartres*, 276, Appendix 3.6); and Vienna, Österreichische Nationalbibliothek 278, f. 68 (ibid., 295, Appendix 3.14–15).

[93] *Glos. sup. Macr.*, comment. ad 1.1.4: NATVRAM OMNIVM RERVM ET ACTVVM. Commendat Platonem, dicendo ipsum praecellentem aliis in omni philosophiae specie qua philosophi utuntur, id est in practica et theorica quae in suas species sic diuiduntur. Practica, ut diximus, in tres species: ethicam, economicam, politicam. Similiter theorica in tres, quas supra assignauimus. Dicit ergo Platonem inspicere NATVRAM OMNIVM RERVM, quantum ad theoricam [...] ET ACTVVM, quantum ad practicam.

[94] *Glos. Colonienses sup. Macr.*, comment. ad 1.1.4 (169.9–170.1).

[95] Caiazzo, *Glosae Colonienses super Macrobium*, 117–118.

suggest (direct?) dependence; e.g., logic is here defined as the *ordinabilis dispositio temporum*.[96] The oddity of this definition seems to have necessitated some special pleading on the part of the commentator, who parenthetically notes that 'they have taken logic very strictly' (the anonymous *acceperunt* further supports dependence on an external source).[97] Since, however, the *Glosae Colonienses* directly attributes this division to Calcidius, whereas Bernard gave no indication of his source, the author of the *Glosae Colonienses* either had both Calcidius and Bernard before him, or knew the division from a version of Bernard's gloss that correctly identified its source.

Since Bernard's presentation of the Stoic tripartition offers no subdivisions and his version of the Peripatetic bipartition omits mathematics, the question arises: does music have any substantial role in Bernard's commentary? First, its presence as part of the quadrivial subdivision of physics (as in Isidore) seems to be assumed as a matter of course. When discussing the division of the world soul (a subject explicitly included under *physica* in the accessus), Bernard comments:[98]

> And throughout this passage understand the knowledge of the quadrivium, in which there consists the perfection of knowledge: through numbers, understand arithmetic; through the fact that they are linear, square, and cubic numbers, understand geometry; through the consonances that are proportionally marked out, understand music as well as astronomy, which deals with the musical harmony of the celestial spheres.[99]

Musica, for Bernard, is clearly subsumed within *physica*, and it does not receive explicit attention *per se* (no further subdivision, no independent definitions, etc.). Although Bernard may not be as generous in his attention to music as were later authors in the commentary tradition, he nonetheless laid the important groundwork for these later developments by codifying mathematics, the concept of *proportio* in particular, as the primary epistemological ground for *physica* in the context of Timaean cosmology.[100] In his comments on the concluding sentence of Calcidius' translation (53c), Bernard

[96] *Glos. Colonienses sup. Macr.*, comment. ad 1.1.4 (170.1–3): Theologia est scientia de divinis, ut de togaton, de mente et anima; phisica de corporeis essentiis tam divinis quam caducis; loica ordinabilis dispositio temporum.

[97] *Glos. Colonienses sup. Macr.*, comment. ad 1.1.4 (170.3–4): stricte multum acceperunt loicam.

[98] *Bernardi Glos. sup. Tim.* 5.143–147: Et per haec omnia scientia quadruuii intelligitur, in quo est perfectio scientiae: per numeros, arithmetica; per hoc quod lineares superficiales cubici sunt numeri, geometria; per consonantias proportionaliter notatas, musica et astronomia, in qua de musico concentu sperarum agitur.

[99] I quote this passage in full partly because neither Dutton's original punctuation (Dutton, *The* Glosae super Platonem *of Bernard of Chartres*, 178–179), nor Schrimpf's 'corrected' punctuation (Gangolf Schrimpf, "Bernhard von Chartres, die Rezeption des 'Timaios' und die neue Sicht der Natur," in *Aufbruch – Wandel – Erneuerung. Beiträge zur "Renaissance" des 12. Jahrhunderts*, ed. Georg Wieland [Stuttgart–Bad Cannstatt: Frommann-Holzboog, 1995], 207), later adopted by Speer, "*Scientia quadruvii*," 109, is correct, and the misunderstanding obscures the proper division of the quadrivial sciences.

[100] Speer, "Discovery of Nature," 149–150.

asserts that the arithmetic, geometric, and harmonic proportions are the *gradus philosophiae*.[101] In Calcidius' conclusion, however, these 'steps' are not the proportions but the disciplines themselves:[102] *a pueris aetas illa ueluti principiis altioris doctrinae et tamquam gradibus imbuebatur: geometrica musica arithmetica astronomia*. Thus in Bernard's slight but significant modification, it is the explanatory power of proportion, whose highest *gradus* is the *harmonica proportio*, that allows us to unravel the secrets of the visible world and its invisible bonds.

2.6 William of Conches

A similar emphasis on *proportio* opens William of Conches' *Glosae super Platonem*. After setting out a lightly modified Boethian *divisio philosophiae*, William points out that 'something of all these parts of philosophy is contained [in the *Timaeus*].' The entirety of the quadrivium, however, is summed as follows: 'Where [Plato discusses] number and proportion, there [he deals with] mathematics.'[103] *Musica*, of course, was the mathematical science best suited for this sort of work, insofar as it alone properly concerned *multitudo relata*. And among the quadrivial sciences, only music received multiple levels of subdivision within his broad *divisio scientiae*.

Throughout his works, William maintains a remarkably consistent division that attests to the twelfth-century rehabilitation of the Boethian perspective (though William does not directly cite Boethius and may have known the division as transmitted by Isidore).[104] William, however, subsumes Boethius' division within an expanded *divisio scientiae*, which includes the Peripatetic bipartion as one of two branches (see Fig. 2.2). *Scientia* has two species: *sapientia* and *eloquentia*. The latter, which is propaedeutic to the first, encompasses the trivium (*grammatica, dialectica, rethorica*), and although it is a branch of knowledge, it is not a branch of philosophy. For only the other species,

[101] *Bernardi Glos. sup. Tim.* 8.444–448: DEMONSTRARI CONVENIT NOVO GENERE, scilicet per quasdam proportiones arithmeticas, geometricas, armonicas, qui sunt gradus philosophiae.

[102] *In Tim.* 355 (346.5–6).

[103] *Guillelmi Glos. sup. Tim.* 6.1–6: De omnibus igitur partibus philosophiae aliquid in hoc opere continetur: de practica in recapitulatione positiuae iustitiae, de theologia ubi de efficiente et formali et finali causa mundi et de anima loquitur. Vbi uero de numeris et proportionibus, de mathematica; ubi uero de quatuor elementis et creatione animalium et de primordiali materia, de phisica.

[104] Dyer, "The Place of Musica in Medieval Classifications of Knowledge," 20 inexpliciably claims that, '[William's] classification is based on a pedagogical model ("ordo vero discendi") that corresponds to the Platonic-Stoic scheme: dialectic, ethics, and physics.'

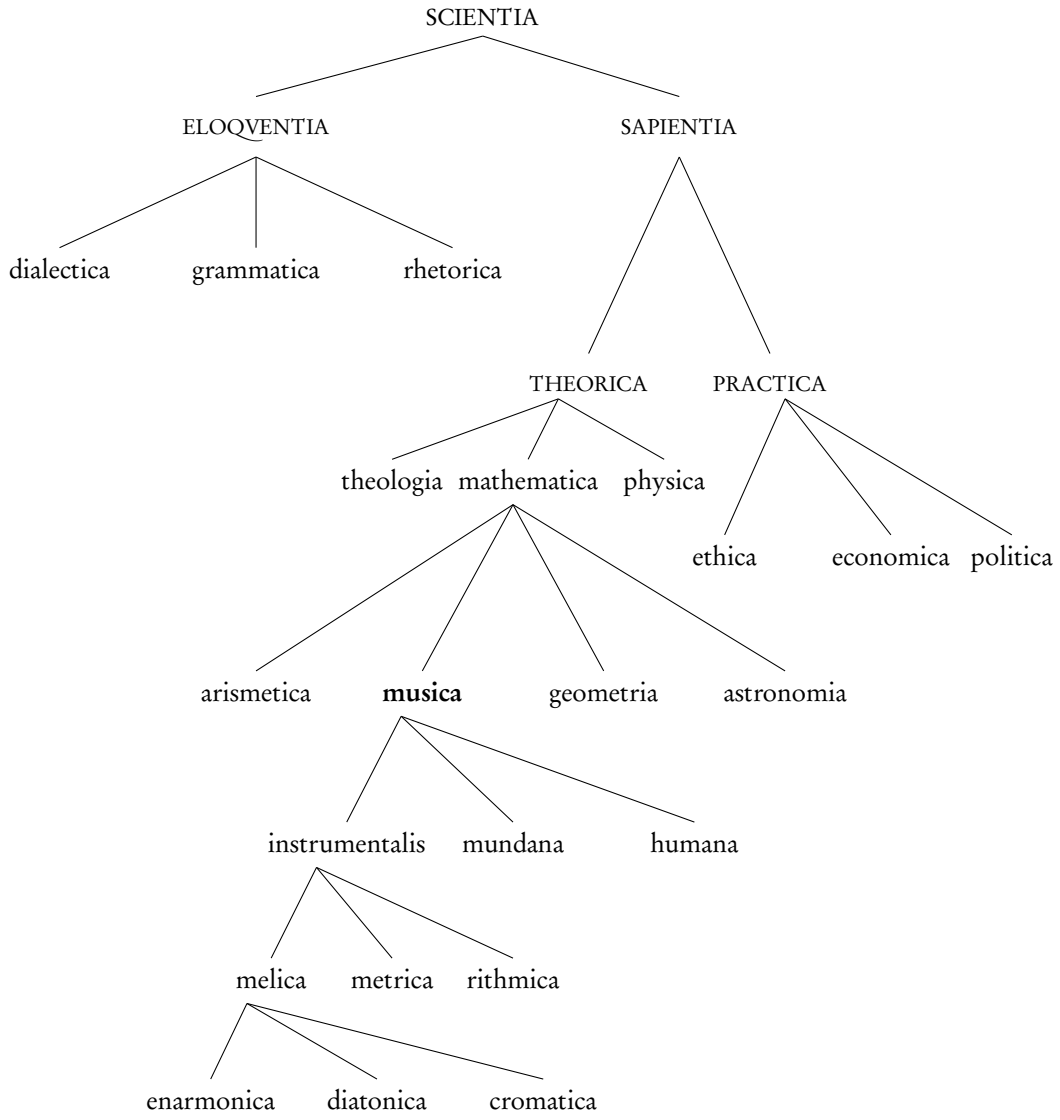


Figure 2.2: divisio philosophiae iuxta Guillelmum de Conchis

sapientia, is identical with philosophy, 'the true comprehension of visible and invisible being,'[105] which is coextensive with Boethius' Peripatetic bipartition.

In his *Accessus ad Platonem*, William divides music into the Boethian tripartite scheme discussed above, but re-orders it without further comment: *instrumentalis*, *mundana*, *humana* (an ordering attested also in the diagram of William's division in BL, Add. 22815, f. 53v). *Instrumentalis* further

[105] *Glos. sup. Boet.* 1.pr1.281–284: Sapientia et philosophia idem sunt. Vnde potest dici quod eloquentia nec aliqua pars eius de philosophia est. *Glos. sup. Macr.*, comment. ad accessus: Sapientia et philosophia idem sunt. Unde potest videri quod nec eloquentia nec aliqua eius pars de philosophia est. *Guillelmi Glos. sup. Tim.* 5.1–2: Philosophia igitur est eorum quae sunt et non uidentur et eorum quae sunt et uidentur uera comprehensio. Cf. *Phil.* 1.1 (43B).

divides into the Cassiodorian (and Isidorian) tripartition: *melica*, *metrica*, and *rithmica*, of which the first divides finally into *diatonica*, *enarmonica*, and *cromatica* (the three melodic genera discussed in Boethius' *De institutione musica*).

Although William closely adheres to Boethius' order of the theoretical sciences (*theologia*, *mathematica*, and *physica*), when he discusses the sciences from the standpoint of an epistemological ascent (i.e., the *ordo philosophiae*), he strikingly reverses the order of mathematics and physics – again without any further comment.[106] This subtle re-ordering accords well with William's synthesis of the Peripatetic and Stoic division found in the *Glosae super Macrobium*. Encountering Macrobius' tripartition at the end of the *Commentarii in Somnium Scipionis*, William quickly (and, it must be said, forcibly) brings the Stoic tripartition into the Peripatetic fold. Macrobius' *moralis* is equated with ethics (i.e., *practica*) and *rationalis* is equated with *omnis theorica*. *Naturalis*, however, encompasses the quadrivium.[107] The apparent duplication of the quadrivium (under both *naturalis* and *rationalis*) must not obscure the larger point: the quadrivial sciences serve the study of nature throughout William's œuvre, despite their co-ordinate presentation in his *divisio philosophiae*. In particular, the harmonic language of proportion holds considerable explanatory value, for as William defines it, proportion is not solely the property of numbers – it is the *habitudo rei ad rem*.[108]

2.7 Bernard Silvestris

The division of the sciences in Bernard Silvestris' *Commentum in Martianum*[109] follows William in the Boethian bipartite division. *Scientia*, the *agnitio rerum comprehensibilium* is a genus with

[106] *Glos. sup. Boet.* 1.pr1.343–356: Notandum quod dicit ad hoc gradus illos esse ut ab inferiori ad superius ascendatur, non de superiori descendatur ad inferius, quia de practica ascendendum est ad theoricam. [...] Deinde cum istis [sc. moribus] est perfecte exercitatus, debet transire ad contemplationem eorum quae sunt circa corpora, *per mathematicam et phisicam*, usque ad caelestia; deinde ad contemplationem incorporeorum usque ad creatorem per theologicam. Et hic est ordo philosophiae.

[107] *Glos. sup. Macr.*, comment. ad 2.17.15: MORALIS, ethica. NATVRALIS, sub ista specie continetur totum quadriuium. RATIONALIS, haec tertia species continet omnem theoricam.

[108] *Guillelmi Glos. sup. Tim.* 82.1.

[109] *Comm. in Mart.* 3.889–1018. Bernard's authorship of the commentary has been disputed. See Stephen Gersh, "(Pseudo?-) Bernard Silvestris and the Revival of Neo-Platonic Vergilian Exegesis," in *Sophies Maietores: Chercheurs de sagesse. Hommage à J. Pépin*, ed. Marie-Odile Goulet-Gazé, Goulven Madec, and Denis O'Brien (Paris: Institut d'Études augustiniennes, 1992), 573–593; Michael Evans, "The *Ysagoge in theologiam* and the Commentaries Attributed to Bernard Silvestris," *Jounal of the Warburg and Courtauld Institutes* 54 (1991): 1–42; Julian Ward Jones, "The So-Called Silvestris Commentary on the *Aeneid* and Two Other Interpretations," *Speculum* 64 (1989): 835–848; E.R. Smits, "New Evidence for the Authorship of the Commentary on the First Six Books of Virgil's *Aeneid* Commonly Attributed to Bernardus Silvestris," in *Non nova, sed nove: Mélanges de civilisation médiévale dédiés à Willem Noomen*, ed. Martin Gosman and Jaap Van Os, Mediaevalia Gronigana 5 (Groningen, 1984), 239–246. Haijo Westra and I will take up this question again in our jointly edited revised edition of the commentary for CCCM.

four species: *sapientia*, *eloquentia*, *poesis*, and *mecania*.[110] The first two map William's Boethian *divisio*, but with explicit and epistemologically motivated discrepancies, already hinted at (but not fleshed out) in William's works. Bernard enumerates the order of the theoretical sciences differently than did Boethius, for whom mathematics held the medial position between theology and physics. Bernard, however, rates theology and physics as theoretical sciences 'higher' than mathematics. His rationale synthesizes Boethius' ontological and epistemological approaches: the three theoretical sciences, from an ontological standpoint, descend from theology (invisible substances), through physics (invisible causes of the visible world), to mathematics (visible forms of the visible world); from an epistemological standpoint (deemed by Bernard the *ordo discendi*), human knowledge must ascend from the visible to the invisible. Bernard buttresses this re-ordering with the language of Boethius' *De institutione arithmetica*, reminding us that the mathematical sciences of the quadrivium both lead the mind from sense perception to 'the greater certainties of understanding' – by which (according to Bernard) Boethius intends theology – and re-illuminate the eye of the mind.[111] Thus all theoretical knowledge has as its starting point the *sapientia* (Philologia) of the quadrivium, the bride of *eloquentia* (Mercurius). Martianus and Boethius are brought into harmony.

Although by the twelfth century the interest in Martianus' technical treatises on the arts (i.e., books three through nine) had waned, this narrowed focus nevertheless did not dissuade commentators from reading music theory into the text. If anything, it gave them further licence to exploit music-theoretical arguments in overtly philosophical and cosmological contexts. Far from being a sequestered, technical discourse relegated to the end of an exhausting nine books, music theory was an ever present theme, a counterpoint, as it were, to Martianus' mythological text. Bernard, in this way, harmonizes his own music-theoretical interpolations with his larger interpretive aims. This twelfth-century reader interprets Martianus' work as a Virgilian and Boethian ascent *ad summum bonum*. Through different narrative trajectories, these three authors nevertheless express one and the same transcendental quest for the realm of true philosophy.[112] And the musical implications of this ascent are nowhere better displayed than in the extensive gloss on the Martianus' opening metrum

[110] See the diagram reproduced in Westra, *The Comm. on Martianus Capella*, 81.

[111] *Comm. in Mart.* 1.14–23; cf. Wetherbee, *Platonism and Poetry*, 112–113.

[112] *Comm. in Mart.* 2.114–9: Auctoris [sc. Martiani] vero imitatio est, quia Maronem emulatur. Sicut enim apud illum ducitur Eneas per inferos comite Sibilla usque ad Anchisem, ita et hic Mercurius per mundi regione Virtute comite ad Iovem. Ita quoque et in libro De Consolatione scandit Boetius per falsa bona ad summum bonum duce Philosophia. Que quidem tres figure fere idem exprimunt.

(1.1 [1.4–2.4]: *Tu quem psallentem*).

This cosmic hymn invokes Hymenaeus as the sacred union of the gods, one who binds together the warring elements with secret chains, nurtures discordant alliances, unites body and soul, reconciles the sexes, and fosters the faith of love. Bernard, as do modern scholars,[113] found this song of cosmic harmony and love concordant with metres from Boethius' *Consolatio philosophiae* (2.m8: *Quod mundus stabili fide*, and 3.m9: *O qui perpetua mundum*). But he also noted another Boethian resonance, that other famous discussion of harmony – the *De institutione musica*. His comments on the invocation to Hymenaeus begin thus:[114]

> *Himeneus* vero et large sumitur pro qualibet concordia et stricte pro nupciis. Unde legis quia illius dei officium est in nuptiis sedes distribuere, quia concordie est unicuique rei locum in rerum coniunctione dare. *Himeneus* itaque, qui preest nuptiis, sit concordia, causa tocius coniunctionis. Namque *Himeneus* confederationis Grece interpretatio est. Hec autem universalis musica plures habet efficatias, quas huius dei officia intelligimus, quasque versus isti exprimunt. [...] Dividitur autem musica in mundanam et humanam et instrumentalem. Mundana quidem est in elementis, in temporibus, in astris; humana in humoribus corporis, in potenciis anime, in coniunctione anime et corporis. Instrumentalis autem est in metris, in rithmis, in melis. Tria ergo sunt *Himinei* [*sic*] officia.

Boethius' *De institutione musica* 1.2, of course, is the source for this threefold division, but what follows is not just a tissue of literal quotations and cribs. Nor is this simply a passing mention, a mere demonstration that the commentator had dutifully read his Boethius. Rather, the division generates the interpretive framework for the *metrum* and provides an epistemological rationale. Just as music has three parts, so too there are three *iudicia animi*: *sensus*, *ratio*, and *intelligentia*. *Sensus* and *ratio* judge *instrumentalis*, *ratio* alone deduces *mundana*, and *ratio* capped by *intelligentia* determine *humana* – *ratio* the body and *intelligentia* the soul. Because we ascend from sense perception, through reason, to understanding, '*instrumentalis* is first, *mundana* second, and *humana* last.' The commentator then proceeds to read this pedagogical and epistemological order back into the *De institutione*

[113] *Comm. in Mart.* 3.23–34, 362–3. Cf. Christopher J. McDonough, "The Verse of Martianus Capella: Text, Translation, and Commentary on the Poetry in Books 1–V" (PhD Thesis, University of Toronto, 1968), 210–211; Stock, *Myth and Science in the Twelfth Century: A Study of Bernard Silvester*, 33.

[114] *Comm. in Mart.* 3.16–40: Hymenaeus is construed both broadly as any sort of concord and narrowly as marriage. Whence you read that it is the function of this god to set out the foundations in marraige, as it concord's job to give each and every thing a place in the union of things. Hence, let Hymenaeus, who presides over marriages, be concord, the cause of every union. For in Greek, Hymenaeus means 'confederation'. This universal music is influential in many aspects, which we understand as the functions of this god and which these verses express. [...] For music is divided into *mundana*, *humana*, and *instrumentalis*. *Mundana* consists in the elements, the seasons, and the stars; *humana* in the bodily humors, in the powers of the soul, and in the union of soul and body. *Instrumentalis*, however, consists in meters, rhythms, and melodies. These then are the three functions of Hymenaeus.

musica: 'Boethius, attending to this order, since he took pains to discuss the totality of music, began with *instrumentalis*, then spoke of *mundana*, and finally *humana*. For teaching must follow the order of understanding, not the order of reality.'[115] To my knowledge, the link Bernard forges between the *iudicia animi* and the tripartite division of music is original. Far from slavishly following his sources, Bernard strives to use his own music-theoretical interpolation to create an albeit *ad hoc* and sometimes strained[116] hermeneutic framework – one that will support his interpretation of the *metrum* as an ascent *per creaturas ad Creatorem*: from *sensus (musica instrumentalis)*, via *ratio (musica mundana)*, to the level of true *intelligentia (musica humana)*.

This is a strategic and (one assumes) purposeful mis-reading of Boethius, for *De institutione musica* 1.2 (as we have already seen)[117] clearly draws the epistemological continuum from *instrumentalis* to *mundana*; *humana* was the intermediary, not the summit.[118] The re-ordering, however, harmonizes the Boethian division of music with twelfth-century Timaean cosmology. Calcidius divided the translated portion of the *Timaeus* into two parts: the first, through 39e, covers the causes and creation of the world; the second, 40a to 53c, concerns the creation of animate beings, including man. The twelfth-century readers of the *Timaeus* structured both their commentaries and their understanding of Plato's *ordo discendi* accordingly: *mundana* precedes *humana* (consider, for instance, Bernard's *Cosmographia*: *megacosmos* precedes *microcosmos*). Hence, by reversing the mundane and the humane in the *De institutione musica*, Bernard sought to make Boethius a better (twelfth-century)

[115] *Comm. in Mart.* 3.42–63: Instrumentalis quidem partim iudicum habet sensum, partim rationem. Auditus namque gravitatem et acumen capit in vocibus, ratio vero intervallum et proportionem et numerum. Mundane autem iudicium est ratio, at humane ratio quantum ad corpus, intelligentia quantum ad animam. Et quia familiarior est sensus ratione humanitati, ratio quoque intelligencia, que solius Dei est et paucorum admodumque lectorum hominum, ideo doctrina et agnitione instrumentalis prima est, secunda mundana, novissima humana. Sicut enim homo maior est mundo, qui propter eum factus est, et musica humana maior mundana. Secundum animam quidem attenditur ista maioritas. Quantum ad corpus enim dicitur homo microcosmus. Sola vero anime concupiscentia, que quasi eius portio est, maior est mundo, unde eo repleri non potest. Prefatum ordinem attendens Boethius, cum de tota musica disserere curam suscepisset, ab instrumentali orsus est, succendentur dicturus de mundana, tandem humana. Doctrina enim eligit ordinem agnitionis non nature in rebus. Unde tractatus de creaturis ubique tractatum de creatore precedit. [...] Et eundem ordinem observans Martianus primo instrumentalis indicat efficatiam, dicens: *Tu quem psallentem*, et cetera; deinde mundane his verbis: *semina qui archanis*, et cetera; novissime humane.

[116] On account of this framework, the commentator is occasionally obliged to backtrack or excuse off-topic asides. For instance, his gloss on *Calliopea* (*Comm. in Mart.* 3.76–84), included within the opening *musica instrumentalis* division for grammatical reasons, briefly touches on the 'armonia celestis.' Hence, as he begins his subsequent discussion of *musica mundana*, he is forced to comment (*Comm. in Mart.* 3.288–90): Hactenus de instrumentali. Quod enim de *Calliopea* dixit non ad mundanam referendum est, set potius ad instrumentalem.

[117] See above, 2.1 (p. 52).

[118] As the anonymous author of an *Epistola cum tractatu de musica instrumentali humanaque ac mundana* formulates it: Mundana musica longe supereminet omnibus scientiis. Haec enim est diliciosa scientia. Haec philosophorum gloria. Haec facit familiarem et conscium divini consilii. (J. Smits van Waesberghe, ed., *Adeboldi Episcopi Ultraiectensis Epistola cum tractatu de musica instrumentali humanaque ac mundana*, Divitiae Musicae Artis, A.II [Buren, 1981]).

Platonist; late-ancient music theory now serves twelfth-century humanism.

2.8 Hugh of St. Victor and related texts

Perhaps the most important of the twelfth-century proponents of the Boethian division of the sciences is Hugh of St. Victor. Hugh's classification as articulated in the *Didascalicon* has been exhaustively studied, and the details do not need to be repeated here.[119] Hugh is the first (in a long tradition) to ground the division of theoretical philosophy in Boethius' *Isagoge* commentary.[120] Despite Hugh's clear Boethian affinities, there is yet a common misunderstanding that Hugh's division (in the words of Weisheipl, who is often cited on this point) 'is a successful combination of the Boethian and Stoic divisions of "science." [...] The basic division of scientific knowledge is that of the Stoics. In this case "physics" is taken to be equivalent to "theoretical" and coextensive with Boethius' tripartite classification of speculative "philosophy."'[121] Numerous scholars have followed suit.[122] Hugh is clear, however, that the Stoic division is not in his sights, and he addresses it directly at 2.16 (*De physica*). After describing the (preferred) Boethian perspective (*Physis natura interpretatur, unde etiam in superiori divisione theoricae physicam naturalem Boethius nominavit*), he notes that 'sometimes (*ali-*

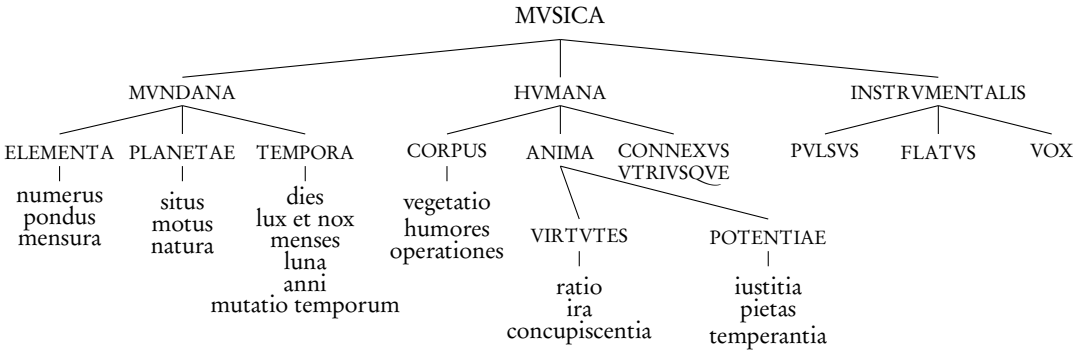


Figure 2.3: divisio musicae iuxta Hugonem de Sancto Victore

[119] See the studies listed supra in note 8.

[120] *Didascalicon* 2.1: theorica dividitur in theologiam, mathematicam et physicam. hanc divisionem Boethius facit aliis verbis, theoricen secans in intellectibilem et intelligibilem et naturalem, per intellectibilem significans theologiam, per intelligibilem, mathematicam, per naturalem, physicam.

[121] Weisheipl, "The Nature, Scope, and Classification of the Sciences," 473–474; Weisheipl, "Classification of the Sciences in Medieval Thought," 65–66.

[122] E.g., Elspeth Whitney, *Paradise Restored: The Mechanical Arts from Antiquity through the Thirteenth Century*, Transactions of the American Philosophical Society 80.1 (Philadelphia: American Philosophical Society, 1990), 84; Jeremiah Hackett, "Roger Bacon on the Classification of the Sciences," in *Roger Bacon and the Sciences: Commemorative Essays*, ed. Jeremiah Hackett, Studien und Texte zur Geistesgeschichte des Mittelalters 57 (Leiden: Brill, 1997), 54; Dyer, "The Place of Musica in Medieval Classifications of Knowledge," 21; etc.

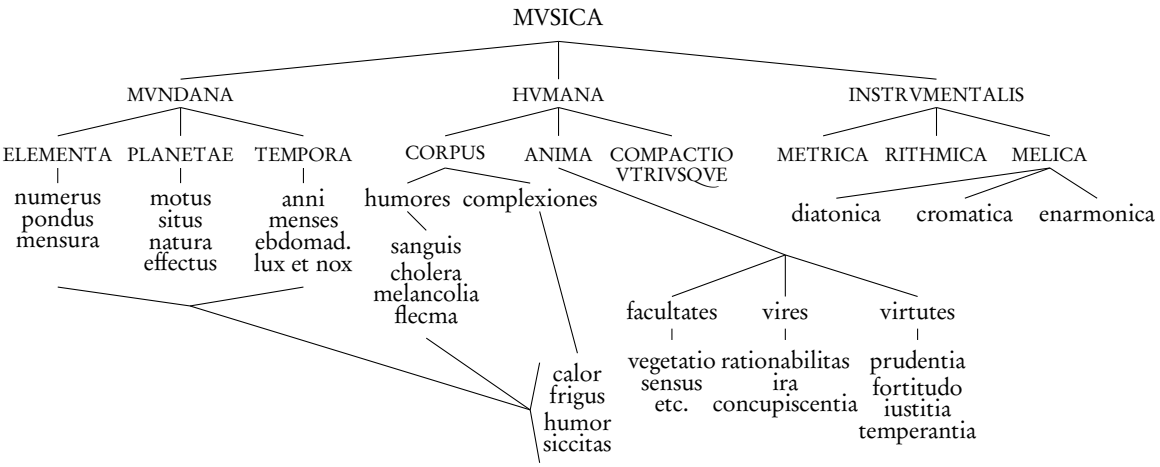


Figure 2.4: divisio musicae iuxta *Tractatum de philosophia*

quando) physics is broadly construed as equivalent to theoretical philosophy,' and that 'some scholars (*quidam*, an odd usage if counted himself among them) divide philosophy into three parts: physics, ethics, and logic.' But such a division, he continues, would leave out the mechanical arts.[123]

Hugh's musical division at 2.12 is the most extensive of all the quadrivial subdivisions in the *Didascalicon* (see Fig. 2.3),[124] and its influence can be seen throughout the twelfth century. It closely matches the various subdivisions employed in Bernard Silvestris' comments on Martianus' opening metrum, and it is central to a short twelfth-century treatise on the division of philosophy, known as the *Tractatus quidam de philosophia et partibus eius*.[125] The greater part of this *divisio philosophiae* is occupied by an exhaustive *divisio musicae* (Fig. 2.4). Though modeled on Hugh's *Didascalicon*, the general definition of music in this treatise betrays a strong Chartrian affiliation: *musica* is the 'science of comprehending proportions in order to understand the concord and discord of *things*.'[126] This definition explicitly grants *musica* a broad mandate to investigate the nature of things in the world. The more restricted examination of sonorous consonance and dissonance belongs only to music's third

[123] *Didascalicon* 2.16: haec etiam physiologia dicitur, id est, sermo de naturis disserens, quod ad eandem causam spectat. physica aliquando large accipitur aequipollens theoricae, secundum quam acceptionem philosophiam quidam in tres partes dividunt, id est, physicam, ethicam, logicam, in qua divisione mechanica non continetur, sed restringitur philosophia circa physicam, ethicam, logicam.

[124] Arithmetic is described in 46 words (2.11), geometry in 96 words (2.13), and astronomy (2.14) in 101 words. The chapter on music (2.12) is longer than all these three combined: 268 words.

[125] The treatise was edited by Gilbert Dahan in 1982 from Paris, BnF lat. 6750, 57r–59r, the only copy known to him: "Une introduction à la philosophie au XIIe siècle: le *Tractatus quidam de philosophia et partibus eius*," *Archives d'histoire doctrinale et littéraire du moyen âge* 49 (1982): 155–193. A better copy of this same text is found in Paris, BnF lat. 8624, 23v–24r, immediately following a commentary on Plato's *Timaeus* (Hisdosus, *De anima mundi in Timaeum Platonis*, as I have deemed the commentary). This latter commentary is discussed in chapter five.

[126] BnF lat. 8624, 23v: musica est scientia perpendendi proportiones ad cognitionem concordie et discordie rerum.

part, *instrumentalis*.[127] The ensuing scholastic divisions of *musica mundana* and *humana* further expand music's scope in the study of the *natura rerum*. The basic outline draws again upon Boethius' *De institutione musica*, 1.2, and Hugh's *Didascalicon*, but the categories are further expanded to encompass developments in twelfth-century natural philosophy, most notably humoral physiology and elemental theory, both of which had been well served by texts newly translated from Arabic (particularly the *Isagoge ad Techne Galieni* and the *Liber Pantechni* of Constantinus Africanus).[128]

The *Tractatus de philosophia* also offers insight into the relationships among the quadrivial arts. The author notes that each liberal art has its own *elementum* by which the questions proper to each discipline are addressed: arithmetic and music deal with axioms (*axiomata*); that is to say, they provide the foundational, rationally demonstrable principles of the mathematical arts. Geometry and astronomy, on the other hand, handle theorems (*theoremata*), insofar as their investigations are based on theoretical, visual models such as the diagrams of planetary movements and the geometrical figures central to the translations of Euclid's *Elements*.[129] These axioms and theoretical models form the foundation for *philosophia*.

A second and quite distinct division of philosophy, found in the curious *Ut testatur Ergaphalau*, offers further support for this view. This small tract, which prefaces Adelard of Bath's *De opere astrolapsus*, presents an idiosyncratic, astrological model of philosophy, but its description of the parts of *sapientia* reinforces this Chartrian view of music as foundational to natural philosophy. This text divides *sapientia* into ministering (*ministrans*) and ministered (*ministrata*) parts: arithmetic and music, the sciences of number *simpliciter* and *ad aliquid*, again lead to knowledge of natural things. And

[127] Ibid.: Secundum uero tertiam partem, id est instrumentalem, sic describitur: Musica est scientia perpendendi proportiones ad cognitionem consonantie et dissonantie.

[128] Humoral physiology and elemental theory are taken up in chapters four and five respectively.

[129] 'Et artes liberales habent propria [prima *Dahan*] elementa quibus dubia uniuscuiusque fidem habeant: grammatica, rationes; dialectica, per se nota et maximas propositiones; rethorica, locos communes et generales; arismetica et musica, anxiomata [antexiomata *Dahan*]; geometria et astronomia, theoremata [thoreumata *Dahan*]' (BnF, lat. 8624, 24v). See Hentschel, *Sinnlichkeit und Vernunft*, 251–253 for a brief discussion of the terms *axiomata* and *theoremata*. Cf., *Anticl.* Prologus (wrongly punctuated by Bossuat [56]): Quoniam igitur in hoc opere resultat grammatice syntaseos regula, dialectice lexeos maxima, oratorie reseos communis sententia, arismetice matheseos paradoxa, musice melos anxioma, geometrie gramatis theorema, astronomice ebdomadis excellentia, theophanie celestis emblema. The phrase *musice melos anxioma*, however, remains a *locus nondum sanatus* (hence, I think, Boussat's punctuation: *musice melos, anxioma geometrie, gramatis theorema*). I think it likely that the uncommon Greek genitive *meleos* (parallel with *syntaseos*, *lexeos*, etc.) has been flattened into the more familiar but grammatically incorrect *melos* (whose genitive is usually *huius meli*). Emend thus: *musice meleos anxioma*. Cf. Alexander Neckam's *Sacerdos ad altere*: Sic a regulis grammatice transeat quis ad maximas dialetice, dehinc ad communes locos rhetorice, postmodum ad aporismata arismetice, postea ad *axiomata musice*, deinde ad theoremata geometrie [...] deinde ad canones Tholomei accedat. Dyer, "The Place of Musica in Medieval Classifications of Knowledge," 5, misconstrues *axiomata* in Neckam's work, suggesting that it is 'possibly a reference to Book 19 of the pseudo-Aristotelian *Problemata* whose subject is music.'

they (together with geometry) are the *ministrantes scientiae* propaedeutic to the *ministrata scientia* of physics, defined as the study of the movements of natural things, both macrocosmic and microcosmic.[130] Speer connects this passage to the conception of the subaltern sciences,[131] but even if we can read subalternation into the language of *ministrans* and *ministrata*, the subalternation suggested by this passage would be at odds with the Aristotelian system developed in the thirteenth and fourteenth century. Whereas the theory of *subalternatio* generally subsumed music to mathematics, or less commonly to natural philosophy, here it is *physica* itself that requires musical, specifically proportional conclusions with which to explain the visible and invisible world. Just how those explanations proceeded is the subject of the next three chapters of the present study.

[130] Charles Burnett, "Adelard, Ergaphalau, and the Science of the Stars," in *Magic and Divination in the Middle Ages: Texts and Techniques in the Islamic and Christian Worlds*, Variorum Collected Studies Series 557 (Aldershot: Ashgate, 1996), 143: Ministrans est sapientia ut musica et arismetica, que [per] numerorum absolutionem, simpliciter et ad aliquid, ad scientiam vel ad noticiam naturalium introducunt. Ministrate est velut geometria et physica quarum altera tantum alteri ministrat. [...] Est igitur sola phisica ministrata que naturales immutationes rerum secundum transitum et moras continenter absolvit. Que duplex reperitur. Alia enim dicitur microcosmica, alia megacosmica.

[131] Speer, "*Scientia quadruvii*," 105.

CHAPTER THREE

MVSICA INSTRVMENTALIS: SOUND AND SYSTEM

As we have seen in the divisions laid out in the foregoing chapter, *musica instrumentalis* – the last of Boethius' tripartition but the first (as in Boethius' own treatise)[1] to be discussed here – is generally interpreted as *musica* constituted *in sonis*. Boethius describes this third category as follows:[2]

> [...] the third [sort of music] is that which is created in certain instruments, such as the cithara or tibiae or other instruments that are servants to song. [...] This sort of music is created either through tension (as in strings), through breath (as in tibiae or instruments activated by water), or through some sort of percussion (as in instruments that are hammered into bronze concavities). From these, various sounds are produced.

This category, then, encompasses the various sonorous manifestations of *musica* in the domain of the sense-perceptible, the realm of sound. It includes, in short, music in the usual sense of the term. And because of the philosophical bent of the sources for this study, they have little to say about music either as contemporaneous practice or as contemporaneous theory. The proper performance and modal classification of liturgical chants, the rules governing the combinations of voices in *organum*, or the theoretical foundations for the eight 'church modes' – these are not the concerns of the cosmologists, and thus such issues are not, perforce, the concerns of this chapter. Nor, for that matter, can we complain about their silence on such issues any more than we can complain that the Cistercian chant reformers in the mid-twelfth century said nothing about the composition of the *elementa mundi* or the construction of the *anima mundi*. It simply was not their brief, nor was it their (primary) business. Admittedly, some of the writers considered in these pages had, it seems, more than a passing acquaintance with music *qua* performance. Adelard of Bath, for instance, recalls playing the *cithara*

[1] *Inst. mus.* 1.2 (189.11–12): de hac igitur instrumentorum musica primo hoc opere disputandum videtur. Given that Boethius' treatise is incomplete, it would be more accurate to say that it is, perforce, the only to be discussed.

[2] *Inst. mus.* 1. (187.21–189.11): [...] tertia, quae in quibusdam constituta est instrumentis, ut in cithara vel tibiis ceterisque, quae cantilenae famulantur. [...] Haec vero administratur aut intentione ut nervis, aut spiritu ut tibiis, vel his, quae ad aquam moventur, aut percussione quadam, ut in his, quae in concava quaedam aerea feriuntur, atque inde diversi efficiuntur soni. Cf. Cassiodorus, *Inst.* 2.5.6: Instrumentorum musicorum genera sunt tria: percussionalia, tensibilia, inflatilia. Percussionalia sunt acitabula aenea et argentea, uel alia quae metallico rigore percussa reddunt cum suauitate tinnitum. Tensibilia sunt cordarum fila sub arte religata, quae ammoto plectro percussa mulcient aurium delectabiliter sensum, in quibus sunt species cythararum diuersarum. Inflatilia sunt quae spiritu reflante completa in sonum uocis animantur, ut sunt tubae, calami, organa, pandoria et cetera huiuscemodi. Cf. *Exp. Ps.* 80.102–104: Secunda partitio instrumentorum eius est in percussionalia, in tensibilia, in flatilia.

at the request of some French students and the queen herself,[3] and Abelard's activity as a liturgist and composer of hymns has been well documented by Michel Huglo.[4] Nonetheless, the music theory of the cosmologists was predominantly a 'bookish' affair. If writers on chant and polyphony had little use for Boethius' 'philosophical' music theory, then, conversely, the cosmologists, who were far more fascinated by music's hermeneutic possibilities on both microcosmic and macrocosmic levels, paid little regard to the practical concerns of the contemporaneous theories of music that had developed around liturgical chant and other musical genres. Yet their silence was not uniformly resolute, and there are occasional glimpses behind the cloak of philosophical theory into the quotidian musical culture of the twelfth-century *ecclesia* and *schola*. Likewise, the music-theoretical language with which commentators describe the extra-mundane musical harmonies occasionally reveals the terminological 'advances' of twelfth-century musical masters.

After discussing the (admittedly few) references to contemporaneous theory and practice in the first section of the chapter (3.1), I turn to the more philosophical concerns that engaged the twelfth-century commentators: the nature of sense perception and the ontology of sound. For whatever numerically based or quantitative ontologies may ultimately underlie music's sonorous manifestation, the most obvious, most direct, and most immediate presentation of *musica instrumentalis* is through the conduit of the ears. Sections 3.2–3.6 focus on the epistemological foundations of hearing and the ontological status granted to the 'objects' of hearing, both sound in general and (when possible) musical sounds in particular. After a detailed re-assessment of the role of sense-perception and acoustical theory in Boethius' *De institutione musica* (3.2–3), I engage the twelfth-century reception of Boethius' account (3.4), which necessitates a look at the discussion of *uox* in logical and grammatical works, which took as their starting point the Stoic theory of *uox* as promulgated in Priscian's *Institutiones grammatici* (3.5). This tradition in turn is taken up and expanded in the writings of the *physici* or natural philosophers, discussed in 3.6.

[3] *De eodem et diuerso* 52: tu ipse [sc. addressing Adelard], si recolligis, cum preterito anno in eadem musica Gallicis studiis totus sudares adessetque in serotino tempore magister artis una cum discipulis, cum eorum Regineque rogatu citharam tangeres, puerulus quidam non certe locutionis sono irretitus, ex cithare sonitu tanta hilaritate effectus est ut et manus digitosque suos simili nisu movere aggrederetur, omnibusque astantibus risum moveret. The *regina* in question is a matter of debate: perhaps the English Queen Matilda during her stay in Normandy in 1106, or the French Queen, Bertrada of Montfort, queen consort until 1108.

[4] Michel Huglo, "Abelard, poete et musicien," *Cahiers de civilisation médiévale* 22 (1979): 349–61.

3.1 References to contemporaneous practice and theory

References to contemporary musical practice are infrequent and, while not entirely inconsequential, are not particularly robust. The handful of references are all in response to a single remark by Macrobius (*In Som. Scip.* 2.3.5) that the ancients sang metrical hymns to the gods *per stropham et antistropham*; the *stropha* indicated the regularity of the fixed stars, the *antistropha* the contrary wandering of the planets.[5] One common gloss on this passage explained the *stropha* and *antistropha* through responsorial psalmody, as in a twelfth-century gloss in London, British Library, Harley 2633 (45r):

> VT PER STROPHA. Stropha fit quando finito ⟨uersu⟩ replicamus responsorium a medio; anti⟨s⟩tropha dicitur contraria conuersio, quando responsorium non a medio sed a principio replicamus. Inde etiam dicitur antiphona quasi contrarius sonus, quia finito ⟨p⟩salmo a principio replicatur. Aliter: stropha est quando responsorium cantatur et uersus usque ad finem, antistropha [*scripsi*, antiphona *cod.*] uero quando resumimus regres⟨s⟩um. Et sic aplanos habet cantans stropham ab oriente in occidente⟨m⟩, alie septem stelle antistropham.[6]

A more intriguing variation on this gloss is found in an interpolated version of William of Conches' *Glosae super Macrobium* (Copenhagen, Det Kongelige Bibliotek, Gl. Kgl. Sammlung 1910 4°, f. 112r):

> Stropha dicitur simplex conuersio, et est stropha recta conuersio cantus quando fit sine organo. Antistropha est contraria conuersio quando organum cantui adhibetur, quia dum cantus extollitur, organum deprimitur et e conuerso. Vnde cantus ymnorum inuentus est per stropham et antistropham ad sonum firmamenti et planetarum qui contra celi conuersionem uoluuntur. Vnde quidam cantus solebant esse in eccelsia quod uocant strophas.

There is not much to go on here. Since the reference to *organum* occurs only in the interpolated version of William's commentary,[7] it is difficult to localize the precise context of this remark. It

[5] *In Som. Scip.* 2.3.5 (104.23–26): in ipsis quoque hymnis deorum per stropham et antistropham metra canoris versibus adhibebantur ut per stropham rectus orbis stelliferi motus, per antistropham diversus vagarum regressus praedicaretur.

[6] Cf. Oxford, Lincoln College Library, lat. 27, f. 148v (heavily trimmed): ⟨stro⟩pha est conuersio, ut quando conuer⟨sio⟩ de responsorio ad uer⟨sum⟩; antistropha ut quando iterum ⟨conuersio⟩ de uersu ad responsorium, ⟨uel ad⟩ totum uel ad partem. A similar explanation is offered in the *Glos. Colonienses sup. Macr.*, comment. ad 2.3.5 (261.1–7): STROPHON dicimus conversionem, quia dum sacrificia circuirent naturali circuitu, strophan cantabant, per quam motum firmamenti designabant. Cum autem per eandem circuitionem reverterentur, ANTISTROPHAN cantabant id est contrarium strophae, ut per regressum motum planetarum significarent. Vel per 'strophan' processum in cantu ut in responsorio; per 'antistrophan' reciprocationem ut in antiphona post versum, inde dicitur antiphona quasi contrarius sonus, quia finito psalmo a principio replicatur. Similar glosses are found in other manuscripts, on which see Peden, "Music in Medieval Commentaries on Macrobius," 155.

[7] In the *uersio breuior* (iuxta Bamberg, Staatliche Bibl., Class. 40 [H.J.IV.21]) and *uersio longior* (iuxta Bibl. Apostolica Vaticana, Urb. lat. 1140) the gloss reads: PER STROPHAM ET ANTISTROPHAM. Stropha dicitur 'simplex conuersio', antistropha 'contra simplicem conuersionem'. Vnde cantus hymnorum inuentus est per stropham et antistropham ad sonum firmamenti et planetarum qui contra caeli conuersionem uoluuntur. Vnde quidam cantus solebant esse in

seems highly probable that William would have been familiar with the performance of *organum* as it resounded *in choro sanctae Mariae* (be it Notre Dame of Chartres or Notre Dame of Paris) in the early- to mid-twelfth century.[8] Even this laconic description of *organum* suggests, perhaps, a first hand knowledge of such performance, or at least a familiarity with the theoretical descriptions of *organum*. The Macrobian commentator's emphasis on contrary motion – 'when the chant lifts on high, the organal voice dips low, and vice versa' – closely echoes, both *ad sensum* and *ad litteram*, the description of *diaphonia* in Johannes Affligemensis' *De musica*: *ut ubi in recta modulatione est elevatio, ibi in organica fiat depositio et e converso*.[9] But whether we can attribute this gloss directly to William of Conches, or where the author might have gained such knowledge (Chartres? Paris?) remain unknown and, it must be admitted, unknowable. The gloss is a one-off, and we have no more to go on. The more generic version of this gloss (*sine organo*), however, found its way into the *Magnae Derivationes* by the twelfth-century Bolognese grammarian, Huguccio of Pisa,[10] through which it resurfaced later in the *Commentum Oxoniense in musicam Boethii* (occasioned by a discussion of the *musae* and the etymology of *musica*)[11] and Jacobus of Liège's *Speculum musice* (6.35) as part of his

ecclesia quos uocabant strophas. On the interpolated commentary, see Helen Rodnite, "The Doctrine of the Trinity in Guillaume de Conches' Glosses on Macrobius: Texts and Studies" (PhD Thesis, Columbia University, 1972), 79–91, and Caiazzo, *Glosae Colonienses super Macrobium*, 67.

[8] William himself refers to 'in choro sanctae Mariae' in his *Glosulae de Magno Prisciano*, *Versio Prima* (Florence, Biblioteca Laurenziana, San Marco 310, 63vb). The twelfth-century performance of *organum* in both churches is documented, respectively, in the Chartrian *Ordo veridicus*, on which, see Margot Fassler, *Gothic Song: Victorine Sequences and Augustinian Reform in Twelfth-Century Paris*, Cambridge Studies in Medieval and Renaissance Music (Cambridge: Cambridge University Press, 1993), 87–91 and the various testimonies assembled by Michel Huglo in "Les débuts de la polyphonie à Paris: les premiers *organa* parisiens," *Forum Musicologicum: Basler Beiträge zur Musikgeschichte* 3 (1982): 93–163; see also Craig Wright, *Music and Ceremony at Notre Dame of Paris*, Cambridge Studies in Music (Cambridge: Cambridge University Press, 2008), 235–272.

[9] Smits van Waesberghe, *Johannes Affligemenisis, De musica cum tonario*, Corpus scriptorum de musica 1 ([Rome]: American Institute of Musicology, 1950), 160.

[10] Uguccione da Pisa, *Derivationes*, ed. Enzo Cecchini and Guido Arbizzoni (Florence: SISMEL edizioni del Galluzzo, 2004), 1183–1184 (S 333): STROPHOS vel trophos grece, latine dicitur conversio [...] Item stropha dicitur conversio simplex in cantilenis, et componitur antistropha, idest contra conversionem simplicem: stropha est cum fit mutatio de responsorio ad versum ubi est quedam conversio mutate melodie prioris; antistropha est quando, finito versu, reincipitur ipsum responsorium vel eius medietas. Unde cantus ymnorum inventus est per stropham et antistropham ad sonum firmamenti notandum et planetarum, qui contra celi conversionem volvuntur; unde Macrobius 'In ipsis etiam ymnis deorum per stropham et antistropham [etc.]' Huguccio the grammarian is, in all likelihood, not the same Huguccio as the later twelfth-century decretist, also Huguccio of Pisa. As Kenneth Pennington and Wolfgang P. Müeller conclude, 'we have no reason to question that the renowned decretist and Huguccio, bishop of Ferrara, were one and the same person. On the other hand, his identity with the Bolognese grammarian of the 1160s, author of the *Derivationes* and Pisan by birth, rests on little more than the identity of names and a handful of interpolated manuscript references' (Kenneth Pennington and Wolfgang P. Müller, "The Decretists: The Italian School," in *The History of Medieval Canon Law in the Classical Period, 1140–1234: From Gratian to the Decretals of Pope Gregory IX*, ed. Wilfried Hartmann and Kenneth Pennington, The History of Medieval Canon Law 6 [Washington, D. C.: Catholic University of America Press, 2008], 148).

[11] *Ut per stroham*, que secundum Hugucionem dicitur *conversio simplex in cantilenis*, scilicet *commutacio de responsorio ad uersum, ubi est quedam conuersio muta[n]te melodie prioris*, significaretur *rectus orbis stelliferi*, id est firmamenti, *motus, per*

etymological discussion of the term *tropi*, one of the three received names (along with *toni* and *modi*) for the musical modes.[12]

Turning from examples of contemporaneous practice to examples of contemporaneous theory, the situation does not seem much improved. The cosmologists' discussions of music theory offer no real 'contributions' to music-theoretical thought, in the manner that, say, the theorists of the 'south German school' offered a new conceptualization of Boethian species-theory to shore up the foundations of the modal system. William of Conches, in his *Glosae super Macrobium*, briefly discusses the species (which he calls *tropi*) of the diatessaron and diapente:[13]

> Sic hucusque ostendit ex quibus numeris nascantur quinque praedictae symphoniae. Nunc de unaquaque tractare incipit. Et primum DIATESSARON CONSTAT DE DVOBVS TONIS ET SEMITONIO. Tribus ordinibus constat haec consonantia. Diatessaron continet duos tonos et semitonium, ut dicit Boetius. Et eodem auctore uocantur 'tropi', conuersiones. Sunt autem hii qui dicunt quod diatessaron constat ex tono et tono et semitonio, uel ex tono et semitonio et tono, uel ex semitonio et tono et tono. Vnde determinant sic: CONSTAT EX DVOBVS TONIS ET SEMITONIO, quocumque ordine dicatur. [...] DIAPENTE CONSTAT EX TRIBVS TONIS ET SEMITONIO. Similiter tropi denotari possunt. Constat enim diapente ex tono et tono et tono et semitonio, uel ex tono et semitonio et tono et tono, uel ex tono et tono et semitonio et tono, uel ex semitonio et tono et tono et tono, et ita sunt quattuor tropi in diapente, in diatessaron tres.

The very fact that William even mentions the species – or rather, the *tropi* – of the diatessaron and diapente is is itself surprising and noteworthy, but they have no larger role to play in his theoretical system. Their deploy here is only to explain why Macrobius needs to specify the order in which semitones and tones comprise the fourth and the fifth. William's ordering of the species concords with Boethius' presentation (save for the reversal of the second and third species of the diapente), but in a manner more reminiscent of the *Alia musica*, he lists the species solely through the position of the semitone without reference to specific pitches within the gamut.[14] The terminological oddity

antistropham vero, que ab 'anti', quod est contra, et 'stropha', id est conversio, componitur, quasi *contra conversionem simplicem*, ut *quando finito versu reincipitur ipsum responsorium vel eius medietas, diversus vagorum*, id est planetarum, *regressus, qui contra celi conversionem volvuntur, predicaretur* (Matthias Hochadel, *Commentum Oxoniense in musicam Boethii: Eine Quelle zur Musiktheorie an der spätmittelalterlichen Universität*, Veröffentlichungen der Musikhistorischen Kommission 16 [Munich: Verlag der Bayerischen Akademie der Wissenschaften, 2002], 40.7–14).

[12] Dicit autem Hugucio quod stropha dicitur simpliciter conversio in cantilenis, cum fit mutatio de responsorio vero ad versum, et anastropha quando, finito versu, reincipitur ipsum responsorium vel eius medietas (Roger Bragard, ed., *Jacobi Leodiensis Speculum musicae*, Corpus scriptorum de musica 3 [[Rome]: American Institute of Musicology, 1955–1973], 3.5: 87).

[13] *Glos. sup. Macr.*, comment. ad 2.1.25.

[14] Cf. Jacques Chailley, ed., *Alia musica: Traité de musique du IXe siècle. Édition critique commentée avec une introduction sur l'origine de la nomenclature modale pseudo-greque au moyen-âge*, Publications de l'Institut de Musicologie de l'Université de Paris 6 (Paris: Centre de documentation universitaire, [1965]), 108 (§17): Denique prima species diatessaron tertio

of William's presentation – the substitution of *tropi* for the usual *species* – may have arisen from a misunderstanding of Boethius' presentation of the modal system at 4.15, the only passage in which Boethius employs the term *tropi*. There, Boethius claims that the *modi*, which are also called *tropi uel toni*, arise from the species of the diapason.[15] The identification of *tropi* with the general concept of intervallic *species* in William's text is, so to speak, the converse of the more common error in music-theoretical treatises, namely the identification of the modes (the *tropi*) with Boethius' octave species.[16] The brief explanation that *tropi* means *conversiones* betrays the hand of Remigius of Auxerre, who in his commentary on Martianus offers the same gloss: *tropi, id est conuersiones uocum*.[17] William is consistent in his terminology, and in the *Glosae super Platonem*, he alludes to the *sesquitercia proportio* (the diatessaron) and the *sesquialtera proportio* (the diapente) in conjunction with a similar usage of *tropi*:[18]

> Et sic habemus has proportiones cum tropis suis, id est conuersionibus suis. Sicut enim, primo medio posito, habemus sesquiterciam et sesquialteram, ita, secundo posito, habemus sesquialteram et sesquiterciam. Et huiusmodi conuersiones uocamus tropos.

Here, William seems to suggest that the octave (the duple ratio) may be either a fourth (4:3) plus a fifth (3:2) or a fifth (3:2) plus a fourth (4:3).[19] Thus, *tropos* in both passages indicates the various *conuersiones* that may underlie a single musical consonance. But again, the intervallic species have no other role to play, for modal theory was simply not a matter of concern for William.

Nonetheless, William's discussion of music in the *Glosae super Macrobium* is of interest for the history of music theory in one important aspect: the reception of the work of Guido of Arezzo. William refers not only to the *musica Boethii*, but also to the *musica Guidonis*, which he cites on three points:

1. 'Guidonian' letter notation;[20]

loco habet semitonium, secunda species secundo, tertia species primo.

[15] *Inst. mus.* 4.15 (341.19–21): Ex diapason igitur consonantiae speciebus existunt, qui appellantur modi, quos eosdem tropos vel tonos nominant. Sunt autem tropi constitutiones in totis vocum ordinibus vel gravitate vel acumine differentes.

[16] On which see Charles Atkinson, *The Critical Nexus: Tone-System, Mode, and Notation in Early Medieval Music*, AMS Studies in Music (Oxford: Oxford University Press, 2009), 187–188.

[17] Lutz, *Remigii Autissiodorensis Commentum in Martianum Capellam* 2:351. Cf. Chailley, *Alia musica*, 105 (§13): tropus de graeco in latinum conversio dicitur. On which, see Atkinson, *The Critical Nexus*, 187.

[18] *Guillelmi Glos. sup. Tim.* 81.11–15.

[19] Cf. *Glos. Colonienses sup. Macr.*, comment. ad 2.1.20 (255.37–39): cum diapason constet dupla proportione et semper infra se contineat diatesseron et diapente (quae sunt eius constitutivae species) [...].

[20] *Glos. sup. Macr.*, comment. ad 2.1.17: Nam in primis instrumentis non erant nisi octo chordae et resonabat prima usque ad octauam. Vnde erat altior et magis in altum extendebatur diapason quam ceterae consonantiae. Inde Guido tali modo composuit suam musicam quod plus quam octo uoces uoluit contineri in aliqua consonantia et illas in solo diapason,

2. the identification of consonances larger than the octave as *replicationes consonantiarum*, rather than *consonantiae simpliciter*;[21] and

3. the parallels between grammatical units (letters, syllables, and words) and musical units.[22]

This last citation is representative of William's rather free and loose use of Guido. William ascribes to Guido the following grammatical parallels: *littera–phthongus*, *syllaba–sonus*, *nomen–consonantia*. These do not, however, match Guido's own parallels as given in the fifteenth chapter of the *Micrologus*.[23] The misrepresentation may stem from the fact that William has attempted to bring Guido in line with the terms set by Macrobius, who says that it is none of his business to detail *quid in sonis pro littera, quid pro syllaba, quid pro integro nomine accipiatur*.[24] Guido's discussion does not easily map onto Macrobius' terms, for Guido says nothing of the *nomen* and employs the term *syllaba* in

et a prima uoce conscripsit unam litteram, 'a' scilicet, et ab octaua aliam 'a'. Cf. Joseph Smits van Waesberghe, ed., *Guidonis Aretini Micrologus*, Corpus scriptorum de musica 5 ([Rome]: American Institute of Musicology, 1955), 2.4–5 (93–94): Sequuntur septem alphabeti litterae graves ideoque maioribus litteris insignitae hoc modo: .A.B.C.D.E.F.G. Post has eaedem septem litterae acutae repetuntur, sed minoribus litteris describuntur. Cf. Ibid. 5.2–8 (107): Diapason autem est in qua diatessaron et diapente iunguntur; cum enim ab .A. in .D. sit diatessaron, et ab eadem .D. in .a. acutam sit diapente, ab .A. in alteram .a. diapason existit. [...] Nam sicut finitis septem diebus eosdem repetimus, ut semper primum et octavum eundem dicamus, ita primas et octavas semper voces easdem figuramus et dicimus. Cf. *Glos. Colonienses sup. Macr.*, comment. ad 2.1.3 (254.10–12): VII sunt discrimina vocum simplicium, que signabantur per alfabetum in monocordo, quarum duae semper unam consonantiam faciunt.

[21] *Glos. sup. Macr.*, comment. ad 2.1.17–18: postea super illas octo uoces nulla erat consonantia, sed semper replicatio consonantiarum. [...] QVAE DICITVR DIAPASON KAI DIAPENTE. 'Kai' in Graeco, 'et' dicitur in Latino. Vnde 'diapason et diapente'. Et numeratur pro una sola consonantia secundum Musicam Boetii, non secundum Musicam Guidonis, quia Guido non uolebat esse simpliciter consonantias, sed replicationes. Guido, in fact, does not take up consonances beyond the octave. He does, however, several times stress that anything beyond the *septem discrimina vocum* (*Aeneid*. 6.646) is a matter of repetition, not addition: quia etsi plures fiant, non est aliarum adiectio sed earundum renovatio et repetitio (Waesberghe, *Guidonis Aretini Micrologus*, 5.17–19 (112)). Clearly, however, this position was, at some point, attributed to Guido. The attestation in William of Conches is the earliest that I know; later examples include Amerus' *Practica artis musicae* (1271): Non autem dico perfectio cantus quod non possit ultra octavam vel duplam cantari, sed quia infra octavam possunt fieri omnes symphonie, scilicet: dyatessaron, dyapente et dyapason, et ultra octavam nulla est symphonia sed replicatio symphoniarum secundum musicam Guidonis, secundum autem musicam Boecii replicationes symphonie sunt (Cesarino Ruini, ed., *Ameri Practica artis musice*, Corpus scriptorum de musica 25 [Neuhausen-Stuttgart: American Institute of Musicology, 1977], 20.13 (83–84)); and Engelbertus Admontensis, *De musica* 2.13: Est enim tripla proportio istarum vocum ad invicem; videlicet sicut est a C.fa.ut usque ad g.sol.re.ut supremum, quam Guido dicit non esse consonantiam, cum transcendat unum diapason: sed dicit illas voces ultra diapason esse solas replicationes inferiorum (Martin Gerbert, *Scriptores ecclesiastici de musica*, 3 vols. [St. Blaise, 1784], 2.308–309).

[22] *Glos. sup. Macr.*, comment. ad 2.4.11: QVID IN SONIS PRO LITTERA. In musica Boethii non habemus aliquod pro nomine integro, uel pro syllaba, uel pro littera. In musica tamen Guidonis pro integro nomine habetur consonantia, pro syllaba sonus, pro littera ptongus, id est imperfectus sonus.

[23] Waesberghe, *Guidonis Aretini Micrologus*, 15.2–5 (162–163): Igitur quemadmodum in metris sunt litterae et syllabae, partes et pedes ac versus, ita in harmonia sunt phtongi, id est soni, quorum unus, duo vel tres aptantur in syllabas; ipsaeque solae vel duplicatae neumam, id est partem constituunt cantilenae; et pars una vel plures distinctionem faciunt, id est congruum respirationis locum. On which see Karen Desmond, "Sicut in grammatica: Analogical Discourse in Chapter 15 of Guido's *Micrologus*," *The Journal of Musicology* 16 (1998): 467–493.

[24] *In Som. Scip.* 2.4.11 (109.5–9): nam netas et hypatas aliarumque fidium uocabula percurrere et tonorum uel limmatum minuta subtilia et quid in sonis pro littera, quid pro syllaba, quid pro integro nomine accipiatur adserere ostentantis est, non docentis.

both a grammatical and musical sense. This latter is a melodic gesture composed of one, two, or three *phthongi, id est soni*, and that, perhaps is the origin of William's identification of *sonus* with *syllaba*.

The most striking example of Guidonian theory, however, occurs without any direct reference to Guido: the systematic use of the solmization syllables. As Stefano Mengozzi has noted in his recent study of the Guidonian hexachord in Medieval and Renaissance music theory, 'Until the mid-thirteenth century the music masters displayed no interest in developing a hexachordal terminology, much less in organizing the six syllables into a fully fledged system.'[25] William's *Glosae super Macrobium* and Bernard's *Commentum in Martianum*, however, suggest that the syllables were already fully-systematized pedagogical standard by the early twelfth century. The context of their remarks – the etymology of diatessaron, diapente and diapason – is entirely conventional, but their explanations of the etymologies are, to my knowledge, without precedent:

Glosae super Macrobium ad 2.1.15–17: Vnde [*sc*. diatessaron] dicitur quasi 'de quatuor' quia continent quatuor uoces coniunctas, has scilicet **ut re mi fa**.

Ideo [*sc.* diapente] ergo 'de quinque' dicitur quia efficitur in quinque uocibus, quae sunt hae **ut re mi fa sol**.

Et dicitur diapason quasi 'de octo' uel 'de omnibus' quia continet infra se octo uoces, has scilicet: **ut re mi fa sol la-re mi fa**.[a]

[a] *post* fa *exp.* sol Bern, Burgerbibl. 266, f. 14v. København, Kgl. Bibliotek, Gl. Kgl. S. 1910 4°, f. 105r *sic distinguit*: ut.re.mi.fa.sol.lare.mi.fa

Commentum in Martianum, 8.277–284: Dicitur autem diatessaron, id est 'de quatuor' quia in quarta corda reperitur, veluti **ut–fa, re–sol**.

Dicitur autem diapente, id est 'de quinque' quia in quinta corda invenitur, veluti **re–la vel ut–sol**.

Et dicitur diapason 'de octo' quia in octava corda occurrit, veluti si **c-fa-ut**[a] ascendas ad **c-sol-fa-ut**.[b]

[a] cefaut *cod.*, re-fa-ut *scripsit Westra*
[b] cesolfaut *cod.*, re-fa-ut *scripsit Westra*

These two texts present slightly different stages in the reception and expansion of the basic Guidonian hexachord. William's usage presupposes at least a double hexachord system, with *ut* transposed to both C and G. When explaining the primary musical consonances, William enumerates their steps with the solmization syllables: the diatessaron (*'de quatuor' vocibus*) and diapente (*'de quinque'*

[25] Stefano Mengozzi, *The Renaissance Reform of Medieval Music Theory: Guido of Arezzo between Myth and History* (Cambridge: Cambridge University Press, 2010), 45.

uocibus) are easily explained within a single hexachord: *ut–fa* and *ut–sol* respectively. The diapason (*'de octo' uocibus*), however, requires mutation, and William's explanation of the eight *voces* in the octave accordingly uses two hexachords; the diapason is VT RE MI FA SOL LA-RE MI FA. LA-RE is the point of mutation from one hexachord to the next. The Martianus commentary ascribed to Bernard Silvestris – in a passage clearly related to William's own discussion – utilizes a full tri-hexachordal system. The diapason, the commentator explains, is the ascent from *C-fa-ut* to *C-sol-fa-ut*. The appearance of the *littera* + *uox* nomenclature here is striking, and it is surprisingly early testimony (*c.* 1150) to a full tri-hexachordal nomenclature. Even more telling is the ease with which the syllables are bandied about within both commentaries. Clearly, they felt no need to explain the usage to their readers and simply assumed that the reader would be well aware how (in William's usage, for instance) nine syllables could explain *de octo*.

William's engagement with Boethius and the music-theoretical tradition may have gone well beyond the occasional glance to Boethius' *De institutione musica* to help illuminate the more technical music-theoretical moments in Macrobius or to flesh out the obscurities of the Timaean *anima mundi*. At the close of Macrobius' self-described *tractatus de musica* (*In Som. Scip.* 2.1–4), he explicitly excuses himself from a longer discussion of matters musical by claiming that to do so would be more ostentation than edification. He thus rounds out his musical discussion with a *praeteritio*, listing the technicalities of which he will not speak.[26] William of Conches, in his commentary on Macrobius, follows suit.[27] But William, in his own *praeteritio*, does not excuse himself entirely, but says that he will leave the discussion of such matters for a more appropriate context: a commentary on Boethius' *De institutione musica*.[28] If William ever completed such a commentary, it has not yet been found or identified. Nonetheless, there does exist a mid-twelfth-century lemmatized commentary on Boethius' *De institutione musica* that has many suggestive connections to the thought of William of Conches, a commentary wherein Macrobius and Calcidius predominate, and the approach is overtly

[26] *In Som. Scip.* 2.4.10–12 (109.3–12): ad inluminandam ut aestimo obscuritatem verborum Ciceronis de musica tractatus succinctus a nobis qua licuit brevitate sufficiet. nam netas et hypatas aliarumque fidium vocabula percurrere et tonorum vel limmatum minuta subtilia, et quid in sonis pro littera, quid pro syllaba, quid pro integro nomine accipiatur adserere ostentantis est, non docentis.

[27] *Glos. sup. Macr.*, comment. ad 1.4.11: Vere iste tractatus de musica habitus sufficit. Nam multa sunt in musica quae ad hunc tractatum non pertinent.

[28] *Glos. sup. Macr.*, comment. ad 1.4.11: ALIARVMQVE FIDIVM, quarum quaedam mese uocantur, quaedam hyperboleos. Nam apud antiquos in instrumento erat tetrachordum, fides cuius tetrachordi uocabantur hypatae, id est principales fides; fides secundi tetrachordi mesae, quasi mediae, aliae scilicet altiores netae, id est excellentes dicebantur; ultimae hyperboleae, id est supra excellentes. Similiter etiam singulis fidibus tetrachordarum imposita sunt uocabula in musica, quod quaedam uocantur hypatae, quaedam parhypatae, de quibus satis dicemus in Musica.

'philosophical' with no (direct) concern for contemporaneous practice: an anonymous commentary copied in a manuscript from St. Florian around the turn of the fourteenth century.

Max Haas, who first brought the St. Florian commentary to light, offered a single footnote's argument that the commentary was perhaps from the twelfth century, but its subsequent editor, Alexander Rausch, claimed, without any clear line of argumentation, that the text arose (hypothetically, he cautions) from the first half of the thirteenth century.[29] Other scholars have seemed content to split the difference and place it somewhere around the turn of the thirteenth century.[30] The accessus format employed by the commentator, however, seems to affiliate the commentary with a specifically twelfth-century tradition and thus strengthens Haas' argument for a twelfth-century origin against Rausch's later dating. The commentator begins by dutifully listing the ten *didascalica* to be treated: *⟨P⟩rimo uidendum est, quid sit musica, quod genus est, quae materia, quod officium, quae partes, quae species, quod instrumentum, quis artifex, quare sic dicatur, quo ordine docenda sit et discenda*.[31] This is not a customary thirteenth-century list, but it accords rather well with a mid-twelfth-century accessus format. Consider, for instance, William of Conches' accessus to his second, mid-century redaction of the *Glosulae super Priscianum*, which treats the following: *quid sit ars ipsa, quod nomen ipsius, quae causa nominis, quod genus, quod officium, quis finis, quae materia, quae partes, quod instrumentum, quis artifex, quis ⟨auctor⟩ [scripsi, doctor cod.], quae auctoris intentio*.[32] Petrus Helias' *Summa super Priscianum*, also mid-century and largely based on William's first redaction, offers an even stronger parallel to the St. Florian commentary: *Ad maiorem artis gramatice cognitionem primo videndum est quid sit gramatica, quod genus eius, que materia, quod officium, quis finis, que partes, que species, quod instrumentum, quis artifex, quare gramatica dicatur, quo ordine etiam docenda sit et discenda*.[33] In fact, the St. Florian accessus is actually closer in structure to Petrus Helias' than his opening list may suggest, for although St. Florian omits *quis finis* in his initial enumeration of the *didiscalica*, he nonetheless sneaks it into the accessus at its proper place, that is, between *officium* and

[29] Max Haas, "Studien zur mittelalterlichen Musiklehre I: Eine Übersicht über die Musiklehre im Kontext der Philosophie des 13. und frühen 14. Jahrhunderts," in *Aktuelle Fragen der musikbezogenen Mittelalterforschung: Texte zu einem Basler Kolloquiumdes Jahres 1975*, ed. Hans Oesch and Wulf Arlt, Forum Musicologicum 3 (Winterthur: Amadeus, 1982), 338: 'ihre Entstehung dürfte ins 12. Jahrhundert anzusetzen sein'. Rausch, "Der Boethius-Kommentar," 11–12: 'Demnach läßt sich die Entstehung des Kommentars hypothetisch auf die erste Hälfte des 13. Jahrhunderts ansetzen.'

[30] Hochadel, *Commentum Oxoniense in musicam Boethii: Eine Quelle zur Musiktheorie an der spätmittelalterlichen Universität*, 30: 'dem vermutlich um die Wende zum 13. Jahrhundert entstandenen Kommentar im Codex St. Florian. . . .

[31] *In inst. mus.* 19.

[32] Paris, Bibliothèque nationale, lat. 15130, 1ra.

[33] Leo A. Reilly, ed., *Petrus Helias, Summa super Priscianum*, 2 vols., Studies and Texts 113 (Toronto: Pontifical Institute of Mediaeval Studies, 1993), 61.2–5.

partes.[34] This rather elaborate accessus format seems to have developed during the second quarter of the twelfth century in the writings of William of Conches, Petrus Helias, Thierry of Chartres and Gundissalinus, and while there is often overlap between twelfth- and thirteenth-century accessus structures, it would yet have been odd for a thirteenth-century commentator to have employed what would have been by then a quite recherché list of ten (or eleven) *didascalica*.[35]

The St. Florian commentary's twelfth-century sympathies run deeper than mere structural parallels. Consider the second sentence of the accessus, his definition of music that fulfills the first promised *didascalicon*:[36]

> Musica igitur est scientia multitudinis relate virtutes proportionum considerans ad concordias rerum, quia sicut arithmetica est scientia multitudinis per se, ita musica est scientia multiudinis relate, et sicut arithmetica virtutes numeroum considerat, sic musica virtutes proportionum, et sicut arithmetica virtutes numerum ad declarationem nature rerum, sic ista ad declarationem concordiarum

The commentator immediately underscores and emphasizes the broad sweep of his definition, reiterating the importance of the *concordia rerum* within the scope of *musica*: *bene dico 'rerum', quia non est intelligendum quod musica tantum consideret sonorum concordias, sed etiam quatuor elementorum et quatuor temporum et planetarum motuum, tum inter se tum ad firmamentum, et eorundem effectuum*.[37] This broad scope definition echoes the similar definitions employed throughout the twelfth century, as discussed above in chapter two: recall, for instance, the *Tractatus quidem de philosophia*: *musica* is the *scientia perpendendi proportiones ad cognitionem concordie et discordie rerum*;[38] or William of Conches' definition of *proportio*: the *habitudo rei ad rem*.[39] As we saw in chapter two, the more restricted examination of sonorous consonance and dissonance belongs only to music's third part, and

[34] *In inst. mus.* 22: Officium est congruus actus artificis secundum artem, id est, virtutes proportionum contemplati. Finis est, ut propter quod fit officium, id est, invenisse concordias rerum. Partes artis sunt ea [...].

[35] See Nikolaus M. Häring, "Thierry of Chartres and Dominicus Gundissalinus," *Mediaeval Studies* 26 (1964): 271–286; Richard W. Hunt, "The Introductions to the 'artes' in the Twelfth Century," in *The History of Grammar in the Middle Ages: Collected Papers*, ed. G. L. Bursill-Hall (Amsterdam: John Benjamins, 1980), 117–144; Alexander Fidora, *Die Wissenschaftstheorie des Dominicus Gundissalinus: Voraussetzungen und Konsequenzen des zweiten Anfangs der aristotelischen Philosophie im 12. Jahrhundert*, Wissenskultur und gesellschaftlicher Wandel 6 (Berlin: Akademie Verlag, 2003), 67–72.

[36] *In inst. mus.* 19: Music therefore is the science of related multitudes that considers the value of proportions for the concordance of things (*rerum*). For just as arithmetic is the science of multitudes *per se*, so music is the science of multitudes in relation to each other; just as arithmetic considers the value of numbers, so music considers the value of ratios; just as arithmetic considers the value of numbers to explain the nature of things, so music [considers the value of numbers] to explain the nature of concordances.

[37] *In inst. mus.* 19: Rightly do I say 'of things', because it must not be thought that music considers only the concordance of sounds, but also [the concordance] of the four elements, the four seasons, and the motions of the planets (both between themselves and between the fixed stars) as well as their effects.

[38] BnF lat. 8624, 23v.

[39] *Guillelmi Glos. sup. Tim.* 82.1.

on this point the St. Florian commentator is in full agreement: *Instrumentalis dicitur, quae attenditur in sonis*.[40]

The sonorous, sense-perceptible reality of *musica instrumentalis*, however, is worrisome to the St. Florian commentator. For, if sense perception is too closely tied to the *scientia musicae*, then, as the commentator notes in a remarkably direct, frank admission, *videtur mihi haec scientia quasi levis et vulgaris aliquam vilitatem et indignitatem inde sortiri*.[41] To contextualize the St. Florian commentator's worries about the status of perception and its (seemingly uncomfortable) connection to *musica qua scientia*, we turn now to Boethius' *De institutione musica*. As we will see, the intellectualization of music *qua* number is not in direct, binary opposition to the sense-perceptible manifestation of music *qua* sound. Rather, already in Boethius and continuing through the twelfth century, these two approaches existed simultaneously, and both find sophisticated expressions and detailed accounts that force us to reconsider the oppositional relation between incorporeal, 'bodiless' number and corporeal, embodied hearing that has been constructed and promulgated in modern scholarship. It is not a binary either-or, but a dialectical both-and. If, as we saw in the opening chapter, Aristoxenian methods gained considerable foothold within the ostensibly Pythagorean tradition, so too here 'orthodox' Pythagorean dogma is considerably tempered by unacknowledged borrowings from Aristoxenian and Aristotelian traditions, borrowings that force us to take with a considerable grain of salt the rather one-sided criticisms that Boethius continually levies against Aristoxenus. Although Boethius upbraids Aristoxenus for assigning all judgment to the ears (*auribus dedit omne iudicium*, 2.31 [267.4–5]) and for trusting not reason but only the senses (*nihil rationi sed tantum sensibus credit*, 5.3 [355.13–14]), Boethius' basic approach to the balance of *sensus* and *ratio* is as much indebted to an Aristotelian, Aristoxenian approach as it is to a Platonic, 'Pythagorean' epistemology.

3.2 Boethius on sense perception and hearing

Boethius begins his *De institutione musica* with a claim that pretends to a simple observation of an obvious truth (1.1 [178.24–179.2]):

[40] *In inst. mus.* 22.
[41] *In inst. mus.* 22.

> Omnium quidem perceptio sensuum ita sponte ac naturaliter quibusdam viventibus adest, ut sine his animal non possit intellegi. Sed non aeque eorundem cognitio ac firma perceptio animi investigatione colligitur.
>
> Clearly the perception of all the senses is so freely and naturally present in certain living beings that an animal without them cannot be understood. But it is not so much knowledge of the senses as it is a firm perception that is adduced by mental investigation.

The assured certainty of Boethius' claim, however, is quietly undermined by the ambiguity of its expression. Semantics is partly to blame – namely, the variable interpretation of the several terms (*perceptio*, *cognitio*, *intellegere*, *colligere*) that crowd and compound the central equivocality of *sensus*, which in Boethius' lexicon can encompass the activity of sensation (sense perception), the content or product of that activity (sensations or sense data), or the faculties that enable such activity (the five senses themselves).[42] Syntax does not help matters. Is *ac* (in the second sentence) a simple coordinating conjunction, as all modern translators have heretofore assumed,[43] or (as I think more likely) correlative with *non aeque* and thus comparative in force, as I have translated above? Is *eorundem* subjective or objective? That is, does it specify the *cognitio* furnished by the senses (subjective – à la Meyer) or the *cognitio* of, that is, about the senses themselves (objective – à la Bower and McKinnon)? And is this genitive distributive across *ac*, as all translators have supposed? If so, why should the meaning of *perceptio sensuum* in the first sentence (which Bower translates as 'perception *through* [. . .] the senses,' [my emphasis]) be forcibly distinguished from its occurrence in the second sentence (which Bower renders as 'perception *of* the senses,' [my emphasis])?[44]

This simple observation is hardly a simple matter. And my interpretation of the second sentence in Boethius' opening gambit subtly changes what is at stake in the question of sensation. Modern translators, by reading *ac* as coordinate and *eorundem* as distributive, have uniformly assumed that Boethius worries here only about the difficulty of sensing the mechanisms of sensation: the percep-

[42] On which, see John Magee, *Boethius on Signification and Mind*, Philosophia Antiqua 52 (Leiden: E. J. Brill, 1989), 98–100.

[43] Bower translates: 'But knowledge and clear perception of the senses themselves are not so immediately acquired through inquiry with the mind' (Bower, *Fundamentals of Music*, 1); Strunk (rev. McKinnon) likewise translates, 'Yet an inquiry by the mind will not provide to the same degree a knowledge and clear understanding of the senses themselves' (Oliver Strunk, ed., *Source Readings in Music History*, revised edition [New York: W.W. Norton, 1998], 137). Meyer follows suit: 'Or la connaissance et la perception sûre [. . .]' (Christian Meyer, trans., *Boèce: Traité de la musique* [Turnhout: Brepols, 2004], 21).

[44] Strunk/McKinnon skirts the problem by translating *perceptio* differently in each case: *perceptio omnium sensuum* = 'the perceptive power of all the senses,' but *perceptio eorundem* = 'understanding of the senses themselves' (Strunk, *Source Readings in Music History*, 137). Meyer opts for the subjective genitive but likewise ducks the repetition of *perceptio*: *perceptio omnium sensuum* = 'la faculté de percevoir par tous les sens,' but *perceptio eorundum* = 'la perception [. . .] qu'ils procurent' (Meyer, *Boèce: Traité de la musique*, 21).

tion of a sensible object is not the same thing as (or is somehow more immediate and more direct than) the perception of (the act of) perception. But Boethius here (as I read him) makes a *contrast* between knowledge of the senses (and sensation) and the firm perception of a sensible: on the former, Boethius remains agnostic; on the latter, he is more optimistic. If I may render Boethius' claim with an anachronistic metaphor: sense perception is analog, not digital. That is to say, unlike digital photography that captures, along with the image, metadata about the image (the camera used, the length of exposure, the shutter speed, aperture, depth of field, etc.), sense perception is rather like an analog camera, insofar as it captures only the image, with no associated metadata, on a medium that is then 'developed' to reveal the image in all its richness. *Investigatio animi*, by which Boethius intends the application of *ratio* or the act of *ratiocinatio*, 'develops' the sense data into a *firma perceptio*, which provides the mind with the *semina cognitionis* (the 'seeds of knowledge') (5.3).

The role of sense perception in the *De institutione musica* thus echoes (if in a simplistic, streamlined fashion) the more robustly philosophical approach articulated in his *De interpretatione* commentaries. There, *sensus* (along with *imaginatio*, which has no comparable role in the *De institutione musica*) provides the initial outlines (*primae figurae*) upon which, as upon a foundation, the supervening intellect rests. Boethius offers an analogy: just as painters are wont to sketch a preliminary outline (*designare lineatim corpus*), which serves as a substrate for the likeness they seek to color, so too sense perception and mental images (*imaginatio*) are natural substrates for the soul's perception. For when some sensible object falls under perception or thought, first it is necessary for a certain mental image of it to arise, and then the more robust intellect supervenes and fleshes out what had been confusedly presumed by the mental image.[45] In short, sense perception is the origin of thought, the *origo intellectus* (*In Perih.* II.24.15).

In the *De interpretatione* commentaries, the nature of sense perception remains very much a background process. But at the outset of the *De institutione musica*, it is precisely the ambiguity of sensation – at both an epistemological and ontological level – that Boethius forces to the fore. It may be *illaboratum* or effortless to recognize that we somehow employ sensation for the perception of sensibles (*sensum percipiendis sensibilibus rebus adhibemus*), but the precise nature of that sensation,

[45] *In PeriH.*, II.28.28–29.10: sensus enim atque imaginatio quaedam primae figurae sunt, supra quas velut fundamento quodam superveniens intellegentia nitatur. nam sicut pictores solent designare lineatim corpus atque substernere ubi coloribus cuiuslibet exprimant vultum, sic sensus atque imaginatio naturaliter in animae perceptione substernitur. nam cum res aliqua sub sensum vel sub cogitationem cadit, prius eius quaedam necesse est imaginatio nascatur, post vero plenior superveniat intellectus cunctas eius explicans partes quae confuse fuerant imaginatione praesumptae.

as both activity and content, is a matter of dispute (*quae vero sit ipsorum sensuum, secundum quos agimus, natura, quae rerum sensibilium proprietas, id non obvium neque cuilibet explicabile esse potest*); more importantly, it is a matter of philosophical dispute (*nisi quem conveniens investigatio veritatis contemplatione direxerit*).[46] *Qua* activity, Boethius' example of the problem is not *auditus*, but *uisus*, which remained for Boethius, as it was for the entire ancient tradition, the paradigmatic sense.[47] Boethius seeks not to explain the mechanics of sight but only to gloss cursorily two standard but opposing theories, Epicurean intromission and Stoic/Academic extramisson,[48] as proof positive that even the learned are in disagreement over the nature of *sensus*.[49] *Qua* content, the visual paradigm remains dominant: whosoever looks at (*respicere*) a triangle or square recognizes (*agnoscere*) what he sees with his eyes (*id quod oculis intuetur*), but only a mathematician knows the true nature of the mathematical forms. But again, how the mathematician moves from the vagaries of *sensus* to the certainty of *intellectus* is nowhere explained.

Boethius then generalizes the epistemological and ontological problems inherent in *uisus* to all sense-perceptible objects: *idem quoque de ceteris sensibilibus dici potest*. But the stakes are apparently higher with regard to the *arbitrium aurium*, for 'the faculty of hearing (*uis aurium*) strives to comprehend sounds (*sonos captat*) in such a way that it not only forms judgments about them and recognizes differences between them, but even more often it is delighted if their measure be sweet and well joined, or it is distressed if they strike the sense as ill-arranged and unconnected.'[50] Although sight may offer the paradigm of sensation, hearing is yet the most valuable (if vulnerable) sense, insofar as it offers the most direct route to instruction or knowledge (*nulla enim magis ad animum disciplinis via quam auribus patet*), a claim analogous to the Aristotelian stance on the superiority of hearing for

[46] *Inst. mus.* 1.1 (179.2–8).

[47] Towey's claim (in "Aristotle and Alexander on Hearing and Instantaneous Change: A Dilemma in Aristotle's Account of Hearing," in *The Second Sense: Studies in Hearing and Musical Judgement from Antiquity to the Seventeenth Century*, ed. Charles Burnett, Michael Fend, and Penelope Gouk, Warburg Institute Surveys and Texts (London: The Warburg Institute, 1991), 9) that Aristotle 'tak[es] hearing as the paradigm of sensation' rests on a series of obscure and difficult arguments that are discussed in depth by Andrew Barker, "Aristotle on Perception and Ratios," *Phronesis* 14 (1981): 248–266. Aristotle, however, does not mince words at *De sensu* 437a4–6: vision, regarded as a supply for the primary wants of life, is in its own right the superior sense, but for developing thought hearing *incidentally* (κατὰ συμβεβηκὸς) takes precedence.

[48] A twelfth-century gloss in Vat. Reg. lat. 1005 properly identifies these theories; see Michael Bernhard and Calvin Bower, eds., *Glossa maior in Institutionem musicam Boethii*, 3 vols. (Munich: Bayerische Akademie der Wissenschaften, 1993–1996), nos. 82 and 83, I: 13.

[49] *Inst. mus.* 1.1 (179.8–11): Adest enim cunctis mortalibus visus, qui utrum venientibus ad visum figuris, an ad sensibilia radiis emissis efficiatur, inter doctos quidem dubitabile est, vulgum vero ipsa quoque dubitatio praeterit.

[50] *Inst. mus.* 1.1 (179.16–20): quarum vis ita sonos captat, ut non modo de his iudicium capiat differentiasque cognoscat, verum etiam delectetur saepius, si dulces coaptatique modi sint, angatur vero, si dissipati atque incohaerentes feriant sensum.

the acquisition of knowledge (*De sensu* 437a10: *κατὰ συμβεβηκὸς δὲ πρὸς φρόνησιν ἡ ἀκοὴ πλεῖστον συμβάλλεται μέρος*). And hearing is the very origin of the discipline of music: *si nullus esset auditus, nulla omnino disputatio de uocibus extitisset.*[51] But although hearing is a necessary first principle (*a sensu aurium huiusce artis sumatur omne principium*),[52] it is not alone sufficient; *sensus* serves rather as a kind of exhortation or admonition, a *quasi admonitio*, to the reasoning faculty to flesh out the occasionally confused and specious perceptions of the ears; the sustained argument of 1.9 (entitled, 'Non omne iudicium dandum esse sensibus, sed amplius rationi esse credendum; in quo de sensuum fallacia') makes this point clear: the judgment of the ears is *obtusa*; without the support of *ratio*, it has no sure judgment (*nullum iudicium certum*), no comprehension of truth (*nulla veri est conprehensio*). But Boethius stops short of denying the *iudicium aurium* any role whatsoever. In fact, the very phrase *iudicium aurium* allows for the perceptual judgement of sensibilia within the domain of perception (which thus cannot be entirely passive).[53]

The standard Boethian definitions of consonance are couched in aesthetic terms that trade on an irreducibly sense-perceptible quality – *suauitas*.[54] At 1.8, a consonance is defined as a 'mixture of high and low sound sweetly (*suauiter*) and uniformly falling upon the ears' (*consonantia est actui soni gravisque mixtura suaviter uniformiterque auribus accidens* [195.6–8]). Likewise at 4.1: 'those sounds are consonant that, when struck at the same time, sound pleasant (*suauem*) and intermingled with each other' (*consonae quidem sunt, quae simul pulsae suavem permixtumque inter se coniungunt sonum* [302.2–4]). Boethius' worries about perception, as articulated at 1.9, are not Platonic worries of the sort articulated in the *Theaetetus* – wherein perception, since its objects are not unchangingly 'real' but always bound within the realm of becoming, is sharply distinguished from knowledge (*Theaet.* 184–186) – but rather are Aristotelian worries about the epistemological accuracy of perception.

[51] *Inst. mus.* 1.9 (195.18–19). Cf. *De anima* 432a7–8: *καὶ διὰ τοῦτο ὔντε μὴ αἰσθανόμενος μηθὲν οὐδὲν ἂν μάθοι οὐδὲ ξυνείη.*

[52] *Inst. mus.* 1.9 (195.17–18).

[53] E.g., *Inst. mus.* 1.33 (223.24–25): omnia [...] et numerorum ratione et aurium iudicio comprobabo; 1.28 (220.2–3): Consonantiam vero licet aurium quoque sensus diuudicet, tamen ratio perpendit; etc. On these and other passages regarding *sensus* and *ratio*, see Klaus-Jürgen Sachs, "Boethius and the Judgement of the Ears: A Hidden Challenge in Medieval and Renaissance Music Theory," in *The Second Sense: Studies in Hearing and Musical Judgement from Antiquity to the Seventeenth Century*, ed. Charles Burnett, Michael Fend, and Penelope Gouk, Warburg Institute Surveys and Texts (London: The Warburg Institute, 1991), 169–198.

[54] The remarks of Hentschel are helpful: '[...] läßt sich schließen, daß er keine Differenz zwischen der Qualität eines Klangs selbst und der Qualität seiner Wahrnehmung annimmt, die aus der sinnlichen Wahrnehmung resultiert, so daß mögliche Ursachen wie Gewöhnung oder Konvention nicht ins Blickfeld rücken' (Hentschel, *Sinnlichkeit und Vernunft*, 25).

Consider, for instance, the claim at 1.9 that:[55]

> Ipse enim sensus aeque maximis minimisque corrumpitur. Nam neque minima sentire propter ipsorum sensibilium parvitatem potest, et maioribus saepe confunditur, ut in vocibus, quas si minimae sint, difficilius captat auditus, si sint maximae, ipsius sonitus intentione surdescit.

This largely recapitulates Aristotle's argument (at *De anima* 426a30–426b2) that 'the excess of either high or low pitch destroys the hearing', a claim which is generalized to all the senses: 'and in the same way in the case of flavors, excess destroys the sense of taste, in the case of colors also the too bright or dark destroys sight, and in the case of smell, a strong odor, either sweet or bitter, is destructive.'[56] It is worth reiterating the point: Boethius' concern here is not with the deceptive nature of the object out there in the world, but rather with the limitations of the organ (or process) that is to perceive the object. In other words, Boethius still allows that, provided sense perception occurs in the proper way by the proper perceiver under the proper circumstances, perception can and indeed does provide a foundation for rational activity. Without hearing, there is no study of music – a very non-Platonic position, insofar as Plato's criteria for a proper science of harmonics (as in *Republic* 531c) demand that sense data be rejected from consideration. We do not, he writes, need to stretch out our ears as if eager eavesdroppers (*οἷον ἐκ γειτόνων φωνὴν θηρευόμενοι*, 531a). Why? Because the objects of perception are not and cannot be the objects of knowledge. It is not a matter of epistemological uncertainty – it is a question of an unbridgeable ontological divide between the always fluctuating world of becoming and the immutable realm of Real Being.

Despite the wash of Pythagorean skepticism regarding the veridicality of perception, Boethius ultimately subscribes to an Aristotelian and Stoic optimism regarding the move from sense perception to knowledge. A crucial passage that points in this direction – a passage that momentarily bridges the seemingly unbridgeable gap between perception and knowledge – occurs at 2.18, wherein Boethius (*secundum Nicomachum*) ranks the consonances on the basis of merit and measure. The diapason graces the top of the list, but the argument for its excellence is grounded in sensation, and strikingly

[55] *Inst. mus.* 1.9 (196.10–15): Sense-perception itself is equally destroyed by the great and the small. For it cannot sense the smallest things on account of the smallness of such sensibles, and it is often destroyed by greater things, as happens in pitches which, if they are very quiet, the hearing captures only with difficulty, but if they are very loud, the hearing is deafened by the intensity of the sound.

[56] *καὶ διὰ τοῦτο καὶ φθείρει ἕκαστον ὑπερβάλλον, καὶ τὸ ὀξὺ καὶ τὸ βαρύ, τὴν ἀκοήν· ὁμοίως δὲ καὶ ἐν χυμοῖς τὴν γεῦσιν, καὶ ἐν χρόμασι τὴν ὄψόδρα λαμπρὸν ἢ ζοφερόν, καὶ ἐν ὀσφρήσει ἡ ἰσχυρὰ οσμή, καὶ γλυκεῖα καὶ πικρά.* On this passage, see Barker, "Aristotle on Perception and Ratios"; Deborah K. Modrak, *Aristotle: The Power of Perception* (Chicago and London: University of Chicago Press, 1987), 56–32.

so. In a passage that has puzzled translators, Boethius writes (and I number the sentences for ease of reference):[57]

> [1] Haec enim ponenda est maxime esse prima suavisque consonantia, cuius proprietatem sensus apertior conprehendit. [2] Quale est enim unumquodque per semet ipsum, tale etiam deprehenditur sensu. [3] Si igitur cunctis notior est ea consonantia, quae in duplicitate consistit, non est dubium, primam esse omnium diapason consonantiam meritoque excellere, quoniam cognitione praecedat.

Claim 2 seems *prima facie* to break ranks with the Pythagoreans. So to keep Boethius from marching out of step, Bower (followed by Meyer) allows his translation a rare moment of special pleading. Bower translates (emphasis added):[58]

> [1] The consonance whose property the *critical faculty* more easily comprehends ought to be classified as the very first and most pleasing consonance. [2] For just as every single thing is in itself, so also it is recognized by the *critical faculty*. [3] Thus, if that consonance which consists of the duple ratio is easier to know *than all the others*, then there is no doubt that the consonance of the diapason, since it precedes the others in being known, is the first of all and surpasses the others in merit.

A footnote provides Bower's rationale for his translation of *sensus*:[59]

> 'Critical faculty' is a translation of *sensus*, a word with a broad spectrum of meaning, ranging from 'perception through the senses' to 'understanding.' Boethius, or his Pythagorean source, is obviously not arguing that 'as every single thing is in itself, so it is perceived by the sense'; to do so would blatantly contradict the basic tenet of Pythagorean thought that the senses are unreliable.

The trajectory of Boethius' argument is perhaps less obvious than Bower suggests; would deploy the term *sensus* in such a loaded context if he did not actually intend to bring perception into play. Nor, for that matter, does the supposition of an unspecified 'critical faculty' clarify matters much. What is this 'critical faculty'? And on what grounds and with what sort of data does it facilitate critique? The usual suspects – the Aristotelian *sensus communis*, the Stoic ἡγεμονικόν, or even the the Augustinian *sensus interior*,[60] – seem unlikely; such perceptual faculties responsible for perceptual

[57] *Inst. mus.* 2.18 (249.22–29). Surprisingly, Sachs omits this passage from his synopsis of the 'most important quotations from the *De institutione musica* concerning the criteria' (Sachs, "Boethius and the Judgement of the Ears," 171–175).

[58] Bower, *Fundamentals of Music*, 72–73. Cf. Meyer's translation: En effet, doit être posée comme la toute première et la plus agréable la consonance dont la faculté critique évalue la propriété plus facilement. De fait, tout ce qui existe par soi-même est appréhendé comme tel par la faculté critique. Donc, si de toutes les consonance, la mieux connue est celle qui repose sur le rapport double, nul doute que l'octave est, de toutes, la première consonance, qu'elle l'emporte à juste titre, puisqu'elle les précède dans la connaissance.

[59] Bower, *Fundamentals of Music*, 73.

[60] E.g., *Conf.* 1.20.31: custodiebam interiore sensu integritatem sensuum meorum.

judgements or discriminations held little interest for Boethius, and they are not employed in any of Boethius' writings. This 'critical faculty' is also, presumably, not yet a fully cognitive faculty, since Boethius had a perfectly good set of terms (*cognitio*, *intellectus*, etc.) had he intended to make such a claim. So this 'critical faculty' must, in Bower's (and Meyer's) translation, somehow fall vaguely between sense perception and cognition, and it unduly complicates the stages in the intellectual process. While the translation 'critical faculty' deftly sidesteps any seemingly 'blatant contradiction' with Pythagorean orthodoxy, it fails to offer a cogent alternative.

I concur that it may be odd for Nicomachus to have made such a claim, but it would not be so odd for Boethius to have done so. It seems at least possible that Boethius here expanded and grounded Nicomachus' arithmetical argument for the excellence of the simplest multiple ratio (*duplicitas*, the duple ratio) with a parallel claim on its primacy via sense perception.[61] And for the sense perception argument to have any force, the claim that *quale est enim unumquodque per semet ipsum, tale etiam deprehenditur sensu* is precisely the sort of claim that Boethius *needs* to make:

> [1] The consonance whose property sense perception apprehends more readily ought to be posited as exceedingly primary and sweet. [2] For everything is apprehended through sense perception to be such as it is in itself. [3] If, therefore, the consonance that consists in the duple ratio (*duplicitas*) is better known to everyone (*cunctis*), then there can be no doubt that the diapason is the first of all consonances and is surpassing in merit, because it comes first in cognition.

Boethius here presents us with the complementary role of *sensus* and *ratio*, the movement from *perceptio* to *cognitio*.[62] The passage offers an attempt to bring his definitions of consonance, which are dependent upon sense perception, into relation with arithmetical ratio and the 'intellectualization' of consonance. The octave, the sense-perceptible manifestation of the ratio 2:1, is not *just* the simplest mathematical ratio (*duplicitas*); it is also, in a more basic way, readily apprehended to be such through perception (*cuius proprietatem sensus apertior conprehendit*). The point is simple: who would deny that the octave sounds consonant? It is as easily recognized as such by any reasonable listener as the square or triangle is easily recognized by a reasonable person (cf. 1.1: *cum quis triangulum respicit vel quadratum, facile id quod oculis intuetur agnoscit*). Moreover, consonance is not merely dependent

[61] This line of interpretation has been successfully argued in Hentschel, *Sinnlichkeit und Vernunft*, 29–32.

[62] Cf. ibid., 30: Es scheint, als würde in der Passage ein Übergang von sinnlicher Wahrehmung hin zu vernunfthafter Erkenntnis gestaltet.

upon the predisposition of the listener (or the sense organ), for it appears so to everyone.[63] This is not yet to claim, however, that the listener knows, from perception alone, the real nature of consonance any more than a casual glance reveals the mathematical nature of a triangle or square. Rather perception captures some distinguishing feature (*proprietas*), and it is in this limited sense that the second claim connects the first to the third. And although the context of the argument is explicitly Pythagorean,[64] Boethius' language is suspiciously Stoic in its Ciceronian terminology: it is tempting to suppose that Boethius' *comprehendere* falls within the semantic field of the Stoic *καταλαμβάνειν*.[65] Hence, we could encapsulate the argument as follows:

1. Whichever consonance sounds the most perceptibly sweet should come first.
2. Sense perception (generally) apprehends things as they are.
3. Hence, if the octave is best known to all, then it is the first consonance.

Perception and mathematics are in full agreement on this point.

Nor is this claim as radically contradictory to Pythagorean thought as it might seem *prima facie*. In fact, numerous early commentators on Pythagorean harmonics emphasize the foundational role of perception in establishing the basic nature of consonance, even if reason ultimately plays a trump card in some special cases (e.g., the octave and a fourth). For instance, Ptolemais, in her *Eisagoge* (as attested by Porphyry), claims that 'Pythagoras and his successors [. . .] wish to accept perception as a guide for reason at the outset, to provide reason with a spark, as it were; but they treat reason, when it has set out from these beginnings, as working on its own in separation from perception.'[66] The passage in Boethius provides precisely this sort of spark; it is a moment that establishes, first by the evidence of sensation and then by the trump card of reason, that the octave is the primary consonance. If

[63] In the third sentence, *cunctis* is better construed as a dative of reference than as an ablative of comparison ('easier to know than all the others'). Hentschel offers the former in a footnote ('für alle bekannter ist') as equally possible, but maintains the latter, 'bekannter ist als die übrigen,' as the translation in his text (Hentschel, *Sinnlichkeit und Vernunft*, 29). It is not, however, a matter of equally possible alternatives: had Boethius intended the latter, he would have written *ceteris* or *cunctis aliis*. Cf. *Inst. ar.* 1.23 (46.19–20): Rursus multiplex est prima pars maioris inaequalitatis *cunctis aliis antiquior* naturaque praestantior. Augustine makes a similar point at *Trin*. 4.2, noting that even the *imperiti* recognize the 'consonance of one to two': Neque nunc locus est ut ostendam quantum ualeat consonantia simpli ad duplum quae maxime in nobis reperitur et sic nobis insita naturaliter (a quo utique nisi ab eo qui nos creauit?) ut nec imperiti possint eam non sentire siue ipsi cantantes siue alios audientes.

[64] *Inst. mus.* 2.18 (249.18–20): Nunc illud videtur addendum, quemadmodum Pythagorici probent consonantias musicas in praedictis proportionibus inveniri.

[65] Cf. Cicero's summary (put in the mouth of Varro) of the Stoic position on perceptual apprehension or *κατάληψις* (*Acad.* 1.11.42): E quo sensibus etiam fidem [sc. Zeno] tribuebat, quod, ut supra dixi, comprehensio facta sensibus et vera esse illi et fidelis videbatur, non quod omnia quae essent in re *comprehenderet*, sed quia nihil quod cadere in eam posset relinqueret, quodque natura quasi normam scientiae et principium sui dedisset. Cf. Aug. *c. Acad.* 3.26; *civ.* 19.18.

[66] Porphyry, *In Ptolemei Harm.* 25.25–30; trans. Barker, *Greek Musical Writings II*, 242.

anything, it is not a moment that demands special pleading from the Boethian expositor; rather, it is a moment of special pleading within Boethius' own argument – an attempt, as it were, to fan the spark of sensation into the fire of knowledge by granting (for the purpose of argumentation) the reliability of basic perception, provided (one assumes) the epistemological worries of 1.9–10 are not in play, e.g., the listener is neither a tone-deaf infant nor a near-deaf, doddering senior, and the diapason is struck at neither an ear-splitting volume nor a scarcely perceptible whisper.

Still, despite the optimistic (from the Pythagorean perspective) bridge that Boethius builds between perception and knowledge at 2.18, we are given here no account of the movement across the bridge. The closest Boethius comes to such an account in the whole of the *De institutione musica* is late in the game, after he has put down Nicomachus and picked up Ptolemy. At 5.2, near the beginning of the apparently incomplete project to continue Nicomachus with a (full?) translation of Ptolemy's *Harmonica*, Boethius returns (*secundum Ptolomaeum*) to the relation between *sensus* and *ratio* and offers a claim similar but slightly (and crucially) modified from its first appearance at 2.18. The perceptible and the perception are no longer in a direct relation of *tale* … *quale*, but rather a qualified relation, *proxime tale* … *quale*: 'sense perception attends to something confusedly and nearly such as is the object it senses'[67] (*sensus namque confusum quiddam ac* proxime *tale, quale est illud, quod sentit, advertit* [352.7–8]). This important qualification, the *approximate* nature of perception, is repeated twice more in quick succession: *sensus invenit quidem confusa ac* proxima *veritati* [352.9–10]; [. . .] *sensus nihil concipit integritatis, sed usque ad* proximum *venit* [352.13–14]. It is reason (*ratio*) that supervenes upon the approximate and imprecise discriminations of sense perception and draws them toward *integritas* and *veritas*. Yet for Ptolemy, as for Boethius, *ratio* requires *sensus*, as ratio on its own has no independent access to external reality. Ptolemy formulates it thus in his *On the criterion* (13.18–20): 'Mind could not begin to think of anything without a transmission from sense perception.'[68] Again, we are reminded of Boethius: *Nam si nullus esset auditus, nulla omnino disputatio de vocibus extitisset*.[69]

Why then is sense perception, though necessary, inferior? The answer is found in sense perception's close connection to matter: whereas the mind is 'simple and unmixed,' sense perception is

[67] This translation, which attempts to preserve the modified *tale quale* relation is admittedly awkward. I can do no better without recourse to paraphrase, e.g., Bower's translation (*Fundamentals of Music*, 163): 'The sense perceives a thing as indistinct, yet approximate to that which it is.'

[68] Cited and trans. in Barker, *Scientific Method in Ptolemy's Harmonics*, 19.

[69] *Inst. mus.* 1.9 (195.18–19).

bound up in matter.[70] But Ptolemy does not go so far as Plato's *Theaetetus* in sharpening the divide between matter and mind. Boethius, moreover, seems to have gone beyond Ptolemy in fleshing out this relation, and he does so in terms of a *species* theory of cognition (and it again is worth remarking the predominantly visual orientation of the passage – *peruidere*, *intueri*):[71]

> Hoc vero idcirco est, quoniam sensus circa materiam vertitur, speciesque in ea conprehendit, quae ita sunt fluvidae atque inperfectae nec determinatae atque ad unguem expolitae, sicut est ipsa materia. Quare sensum quoque confusio sequitur, mentem vero atque rationem quoniam materia non moratur, species, quas pervidet, praeter subiecti communionem intuetur, atque ideo eam integritas comitatur ac veritas, potiusque, quod in sensu aut peccatur aut minus est, aut emendat aut conplet.
>
> This [*sc*. that sense is sometimes mistaken] occurs for the following reason: because sense perception is caught up in matter and apprehends forms (*species*) in matter (*in ea*), forms which are as fluid, imperfect, indeterminate, and imprecise as matter is itself.[72] This is why confusion characterizes sense perception, but because matter does not hinder mental reasoning,[73] reason beholds the forms that it considers free from their inherence in a subject; hence, wholeness and truth characterize reason, and it either emends or completes what is apprehended wrongly or less completely through sense perception.

The term *species* is Boethius' handling of Ptolemy's εἶδος, but the precise movement of this argument seems to be Boethius' own intervention upon his source (doubtless *Harmonics* 1.1). Bower's claim, however, that 'these sentences linking the sense with matter and affirming the independence of mind and reason from matter do not appear in Ptolemy's argument' is only true to a point.[74] For Ptolemy makes both links explicit.[75] What does not appear in Ptolemy's argument, the real burden of Bower's observation, is the re-combination of these connections into a new form that has no direct Ptolomeic parallel. For Ptolemy, the realms of perception and reason are (in a way) distinct and divided (κριτήρια μὲν ἁρμονίας ἀκοὴ καὶ λόγος, οὐ κατὰ τὸν αὐτὸν δὲ τρόπον): hearing is concerned with matter and quality (παρὰ τὴν ὕλην καὶ τὸ πάθος); reason with form and cause (παρὰ τὸ εἶδος καὶ τὸ

[70] On which, see Barker's discussion in Barker, *Scientific Method in Ptolemy's Harmonics*, 19–20.

[71] *Inst. mus.* 5.2 (352.17–26).

[72] Bower translates (Bower, *Fundamentals of Music*, 163: 'and it [sense] grasps species in those things that are in flux and imperfect and that are not delimited and refined to an exact measurement, just like matter itself is.' The antecedent of *quae*, however, must be the feminine plural *species* and not *ea*, which Bower seems to take as neuter plural ('those things'). Boethius' point is that the forms (the *species*), before they are mentally abstracted from matter, are subject to the same material flux.

[73] The expression *mentem atque rationem* is best understood as a hendiadys ('mind, that is, reason'); hence, my translation 'mental reasoning.'

[74] Bower, *Fundamentals of Music*, 163.

[75] The independence of reason from matter = τὸν μὲν λόγον συμβέβηκεν ἁπλοῦν τε εἶναι καὶ ἀμιγῆ; the close connection of sense to matter = τὴν δὲ αἴσθησιν μεθ' ὕλης πάντοτε πολυμιγοῦς τε καὶ ῥευστῆς.

αἴτιον).[76] For Boethius, however, perception and reason are concerned with the same thing in different ways: the object remains identical, and it is the mode of comprehension that changes.[77] And the repeated description of perception's apprehensions as confused[78] strongly recalls the confused mental images (*imaginationes*) – the direct result (impression?) of sense perceptions – and perceptions found repeatedly in the logical commentaries.[79] Boethius here transforms Ptolemy into an abstractionist of a surprisingly Aristotelian cast.

3.3 Boethius on acoustics

Finally, what and how do we perceive when we perceive sounds in general or musical sounds in particular? This is the final aspect of Boethius' account that we must consider before turning to the twelfth-century reception and synthesis of the Boethian perspective. On the question of how we hear, i.e., the physiology and psychology of hearing, Boethius remains silent – and this is not surprising given that Boethius is likewise demonstrably disinterested in the psychology of vision, even though, in matters of perception, sight and seeing are Boethius' primary concern. As to the question of what we hear, i.e., the physics of sound, this belongs to the science of acoustics and remains preliminary to the science of harmonics proper.[80] Accordingly, the acoustical knowledge

[76] Though it must be admitted, with Barker, that to read this claim as a resolution of the 'conflict between reason and perception [...] by dividing up the territory between them, distinguishing different parts of it as the proper concern of each to the exclusion of the other' is 'altogether too simplistic. The operations of the two faculties, and the matters on which they are competent to pronounce, [are] interwoven in complex ways' (Barker, *Scientific Method in Ptolemy's Harmonics*, 16).

[77] Cf. *Cons. phil.* 5.p4.26–30: eandem corporis rotunditatem aliter visus, aliter tactus agnoscit; ille eminus manens totum simul iactis radiis intuetur, hic vero cohaerens orbi atque coniunctus cira ipsum motus ambitum rotunditatem partibus comprehendit. Ipsum quoque hominem aliter sensus, aliter imaginatio, aliter ratio, aliter intellegentia contuetur. Sensus enim figuram in subiecta materia constitutam, imaginatio vero solam sine materia iudicat figuram. Ratio vero hanc quoque transcendit speciemque ipsam, quae singularibus inest, universali consideratione perperdit. Intellegentiae vero celsio oculus exsistit; supergressa namque universitatis ambitum ipsam illam simplicem formam pura mentis acie contuetur.

[78] 352.7–8: sensus namque *confusum* quiddam [...] advertit; 352.9–10: sensus invenit quidem *confusa* ac proxima veritati; 352.12–13: [ratio] accipit [sc. a sensu] vero *confusam* ac proximam veri similitudinem; 352.21: quare sensum quoque *confusio* sequitur; 352.26–27: quod sensus non integre sed *confuse* atque a veritate minus [...] agnoscit, etc.

[79] *In Perih.* II.29.8–10: post uero plenior superueniat intellectus cunctas eius explicans partes quae *confuse* fuerant imaginatione praesumptae; *In Isag.* II.136.22–23: sed eas imaginationes *confusas* atque inevidentes sumunt; *In Isag.* II.164.21–165.7: sed animus cum *confusas* res permixtasque in se a sensibus cepit, eas propria ui et cogitatione distinguit [...] at uero animus, cui potestas est et disiuncta componere et composita resoluere, quae a sensibus *confusa* et corporibus coniuncta traduntur ita distinguit ut incorpoream naturam per se ac sine corporibus in quibus est concreta speculetur et uideat.

[80] A history of ancient acoustical theory remains a scholarly *desideratum*. The posthumous Vinton Frederick Hunt, *Origins in Acoustics: The Science of Sound from Antiquity to the Age of Newton* (New Haven and London: Yale University Press, 1978) (the manuscript, left incomplete, was published by his student, Robert Apfel) treats the Greek tradition only in survey. The article by H. B. Gottschalk, "The *De Audibilibus* and Peripatetic Acoustics," *Hermes* 96 (1968): 435–460 – omitted from the bibliography in Charles Burnett, Michael Fend, and Penelope Gouk, eds., *The Second Sense:*

deemed necessary for an account of harmonics is summarized by Boethius in the first book of the *De institutione musica* at 1.3, i.e., the beginning of the treatise proper after the prooemium of chapters one and two (which concludes: *sed proemii satis est. nunc de ipsis musicae elementis est disserendum*). Thus we can assume that Nicomachus began his *Eisagoge* with a discussion of acoustics – a traditional starting point attested as early as Archytas.[81] In this opening chapter, Boethius defines sound as movement, produced by a blow, that is transferred to and transmitted through the air to the ears, and he quantifies this movement to establish a correspondence between number and pitch. In chapter fourteen, he then describes the diffusion of sound via the Stoic example of waves in water.

First, chapter three. Boethius ultimately subscribes to a Peripatetic view of sound production and transmission. For Aristotle, the striking of a (potentially) resonant object produces a movement within the medium (generally air, but water is allowed as well), and this movement is transmitted to the ear (*De anima* 420a4ff.). But it is *only* movement that is transmitted, not anything within the medium nor the medium itself. Thus, Aristotle would likely object[82] to the 'missile' theory of sound found in Archytas (frag. 1)[83] and perhaps alluded to by Plato (*Tim.* 80a) – sound is not a body, neither air nor water (*De anima* 419b18), but a movement within a bodily medium (be it airy or watery). High and low sounds, then, are produced by (but not identified as) fast and slow movements respectively. *De anima* 420a31–33 makes this clear: 'It is not the case that the sharp [i.e., high pitched] is swift and the heavy [i.e., low pitched] slow: rather, the movement of the one acquires its quality because of the speed, that of the other because of the slowness.'[84] Aristotle thus continues to think of pitch in terms of variable speed, but the speed in question is the speed of the originating blow, not the speed of transmission, a crucial modification of the theory maintained by Archytas and Plato.[85]

Studies in Hearing and Musical Judgement from Antiquity to the Seventeenth Century, Warburg Institute Surveys and Texts (London: University of London, 1991) – remains fundamental. On Aristotelian acoustics (as presented in *De anima* 2.8), see Michael Wittmann, *Vox atque sonus: Studien zur Rezeption der Aristotelischen Schrift "De anima" und ihre Bedeutung für Musiktheorie*, Musikwissenschaftliche Studien 4 (Bamberg: Pfaffenweiler: Centaurus-Verlagsgesellschaft, 1987), 19–122; see also Barker's annotated translation in *Greek Musical Writings II*, 77–80.

[81] Ap. Porphyry, *On Ptolemy's Harmonics*, 1.3: *πρῶτον μὲν οὖν [sc. τοὶ περὶ τὰ μαθήματα] ἐσκέψαντο, ὅτι οὐ δυνατόν ἐστιν εἶμεν ψόφον μὴ γενηθείσας πληγᾶς τινων ποτ' ἄλλαλα*, etc., on which see Carl A. Huffman, *Archytas of Tarentum: Pythagorean, Philosopher, and Mathematician King* (Cambridge: Cambridge University Press, 2005), 129–130.

[82] Cf. the Peripatetic *Problemata* 899b1–7.

[83] *βέλη*: ap. Porphyry, *On Ptolemy's Harmonics*, 1.3.

[84] *οὐ δὴ ταχὺ τὸ ὀξύ, τὸ δὲ βαρὺ βραδύ, ἀλλὰ γίνεται τοῦ μὲν διὰ τὸ τάχος ἡ κίνησις τοιαύτη, τοῦ δὲ διὰ βραδυτῆτα.*

[85] See, for instance, Arist. *Sens.* 448a20–b2, as against Plato *Tim.* 80a–b; cf. *Inst. mus.* 1.30 (221.12–16): Plato autem hoc modo fieri in aure consonantiam dicit. Necesse est, inquit, velociorem quidem esse acutiorem sonum. Hic igitur cum gravem praecesserit, in aurem celer ingreditur, offensaque extrema eiusdem corporis parte quasi pulsus iterato motu revertitur, etc.

Michael Wittmann's brief remarks on Boethius' account of the physics of sound are unduly optimistic regarding Boethius' own hand in shaping the discussion. First, Wittmann's opening claim that 'Boethius nachweislich *De anima* gekannt [hat] und [...] sich auch in der Einleitung zu *De institutione musica* darauf [bezieht] [i.e., 1.2]' seems to misdirect Boethius' citation of Aristotle.[86] At 1.2 (189.1–3) Boethius divides the soul into rational and irrational parts, *ut Aristoteli placet*; as Bower observes, this is probably (if a direct reference at all) a reference to the similar division mentioned approvingly in the *Nicomachean Ethics* (i 13.1102a26–1103a3)[87] and *not* to the *De anima* (432a24–b7), where Aristotle criticizes the rational/irrational bipartition as one of the two common, but incomplete, soul divisions.[88] Wittmann may be correct that Boethius 'nachweislich' knew the *De anima* (he could have pointed to, e.g., *In Perih.* II.27.25ff., though perhaps this is secondhand?), but we cannot infer from the musical treatise's prooemium that *De anima* was necessarily on Boethius' mind. Thus, it is hardly surprising that 'das unmittelbar folgende Tonkapitel (*Inst. mus.* I, 3) [...] sich nicht direkt auf *De anima* II, 8 beziehen [läßt].'[89]

Wittmann allows that Boethius in 1.3 follows Nicomachus, who himself seems to have followed the general contours of the opening to the *Sectio canonis*. Boethius begins his acoustical preliminaries: 'Consonance, which rules every musical melody (*omnem musicae modulationem*), requires sound; sound cannot be caused without a blow or strike; a blow or strike cannot occur unless it is preceded by motion. If everything were immobile, nothing could strike anything else such that one thing impel another, but if everything remained stationary and still, no sound could arise.'[90] This adheres closely to the logic of the *Sectio canonis*,[91] but Boethius' continuation – *idcirco definitur sonus*

[86] Wittmann, *Vox atque sonus*, 128.

[87] Other passages could be added: *EN* v 11.1138b6–13; *Pol.* 1260a5–17, 1333a17–30, 1334b7–28.

[88] Wittmann likewise claims (Wittmann, *Vox atque sonus*, 126) that Boethius 'in der Einleitung zu seinem *De interpretatione*-*Kommentar* [...] referiert wesentliche Gedanken aus *De anima* II, 8 [hat]', but in support of this claim he cites the full prologue (by PL column numbers) without precision. Presumably he has in mind such passages as: *In Perih.* II.4.18–26: Vox est aeris per linguam percussio quae per quasdam gutturis partes, quae arteriae uocantur, ab animali profertur. Sunt enim quidam alii soni, qui eodem perficiuntur flatu, quos lingua non percutit, ut est tussis. Haec enim flatu fit quodam per arterias egrediente sed nulla linguae impressione formatur atque ideo nec ullis subiacet elementis, scribi enim nullo modo potest. Quocirca uox haec non dicitur sed tantum sonus. This simultaneously condenses and expands upon *De anima* 420b28ff. (e.g., that a *tussis* cannot be written has no parallel in Aristotle but rather accords with the grammatical tradition).

[89] Wittmann, *Vox atque sonus*, 128.

[90] *Inst. mus.* 1.3 (189.15–22): Consonantia, quae omnem musicae modulationem regit, praeter sonum fieri non potest, sonus vero praeter quendam pulsum percussionemque non redditur, pulsus vero atque percussio nullo modo esse potest, nisi praecesserit motus. Si enim cuncta sint inmobilia, non poterit alterum alteri concurrere, ut alterum inpellatur ab altero, sed cunctis stantibus motuque carentibus nullum fieri necesse est sonum.

[91] Cf. *Sec. can.* Intro. (114.1–6): *εἰ ἡσυχία εἴη καὶ ἀκινησία, σιωπὴ ἂν εἴη· σιωπῆς δὲ οὔσης καὶ μηδενὸς κινουμένου· οὐδὲν ἂν ἀκούοιτο· εἰ ἄρα μέλλει τι ἀκουσθήσεσθαι· πληγὴν καὶ κίνησιν πρότερον δεῖ γενέσθαι. ὥστε ἐπειδὴ πάντες οἱ φθόγγοι*

percussio aeris indissoluta usque ad auditum – is assumed by Wittmann to be Boethius' own insertion, as it has no direct parallel in the *Sectio canonis*.[92] However, this line approaches a literal translation of Nicomachus (*καθόλου γάρ φαμεν ψόφον μὲν εἶναι πλῆξιν ἀέρος ἄθρυπτον μέχρι ἀκοῆς*)[93] and the Latin adheres much more closely to Nicomachus than to the parallel claim in the *De anima* (420a3–4): *ψοφητικὸν μὲν οὖν τὸ κινητικὸν ἑνὸς ἀέρος συνεχείᾳ μέχρις ἀκοῆς*; e.g., Boethius' *indissoluta* is Nicomachus' *ἄθρυπτον* (both modifying the blow) and not Aristotle's *συνεχείᾳ* (which characterizes the air – a crucial distinction).

Likewise, Wittmann finds Boethius' subsequent quantification of pitch to be 'doppelt bemerkenswert.' In line with post-Aristotelian developments in (Peripatetic) acoustical thought, Boethius quantifies pitch not in terms of the velocity of transmission, nor even (solely) in terms of the velocity of the blow,[94] but in terms of the variable rate of pulsation, which encompasses both velocity and frequency:[95]

> idcirco enim idem nervus, si intendatur amplius, acutum sonat, si remittatur, grave. Quando enim tensior est, velociorem pulsum reddit celeriusque revertitur et frequentius ac spissius aerem ferit. Qui vero laxior est, solutos ac tardos pulsus effert rarosque ipsa inbecillitate feriendi, nec diutius tremit. Neque enim quoties chorda pellitur, unus edi tantum putandus est sonus aut unam in his esse percussionem, sed totiens aer fertitur, quotiens eum chorda tremebunda percusserit .

Mustering a dubious parallel in Philoponus' *De anima* commentary (ad 420a29),[96] Wittmann con-

γίνονται πληγῆς τινος γινομένης· πληγὴν δὲ ἀμήχανον γενέσθαι μὴ οὐχὶ κινήσεως πρότερον γενομένης; and compare with the translation from *Inst. mus.* 4.1 (301.12–16): Si foret rerum omnium quies, nullus auditum sonus feriret. Id autem fieret, quoniam cessantibus motibus cunctis nullae inter se res pulsum cierent. Ut igitur sit vox, pulsu est opus. Sed ut sit pulsus, motus necesse est antecedat. Ut ergo sit vox, motum esse necesse est. See Barbera's remarks at *The Euclidean Division of the Canon*, 115 and 231.

[92] Wittmann, *Vox atque sonus*, 130: 'Auch dies läßt sich nicht aus der *Sectio canonis* ableiten, insofern dort lediglich ein Schlag gefordert wird. [...] Daß es sich dabei um ein Einfügung von Boethius handelt, liegt nahe.'

[93] *Harm.* 4 (242.20–21).

[94] Cf. the *manus* example from this same chapter (189.23–190.1): Motuum vero alii sunt velociores, alii tardiores, eorundemque motuum alii rariores sunt alii spissiores. Nam si quis in continuum motum respiciat, ibi aut velocitatem aut tarditatem necesse est conprehendat, sin vero quis moveat manus aut frequenti aut motu movebit aut raro. Et si tardus quidem fuerit ac rarior motus, graves necesse est sonos effici ipsa tarditate et raritate pellendi. Sin vero sint motus celeres ac spissi, acutos necesse est reddi sonos.

[95] *Inst. mus.* 1.3 (190.2–11): For this reason, the same string, if it is stretched taut, sounds a high sound; if it is relaxed, sounds a low sound. For when it is stretched more tightly, it reverberates with a swifter pulse, returns more quickly, and strikes the air more frequently with close-packed blows. When, however, it is relaxed, it reverberates with loose and slow pulses, which are infrequent because of the weakness of the blow, nor does it vibrate for very long. You should not suppose that when a string is struck that only one sound is given forth or that there is but one blow in the sound, for every time the vibrating string percusses the air, the air is struck.

[96] 'Um dieselbe Bewegung in kurzer Zeit auszuführen, ist eine größere Kraft erforderlich als um sie in längerer Zeit auszuführen, was ja auch bei den stärker gespannten Saiten zutrifft. Die weniger gespannten Saiten umgekehrt, wie z.B. die längste Saite bewegt die Luft in längerer Zeit, hält aber dafür den Ton nur kürzere Zeit aus' (Wittmann, *Vox atque sonus*, 132); *In de An.* 373.31–34: *μείζονος γάρ ἐστι δυνάμεως τὸ ἐν ὀλίγῳ χρόνῳ τὸ αὐτὸ κινῆσαι ἤπερ ἐν πλείονι·*

siders this too a Boethian intervention, specifically a reflection of what Boethius learned about the *De anima* from Ammonius, since 'Boethius [...] wie Johannes Philophonos in Alexandria Schüler des Ammonios [war].'[97] There is, however, no evidence for Courcelle's thesis that Boethius studied with Ammonius in Alexandria, and there are good reasons to suppose that any parallels between Boethius and Ammonius indicate a shared inheritance and not any direct contact, be that contact strictly textual or ἀπὸ φωνῆς (as is clearly the case with Philoponus' *De anima* commentary: ἐκ τῶν συνουσιῶν Ἀμμωνίου τοῦ Ἑρμείου).[98] Here too it is needless to go hunting for a parallel in Philoponus, much less to suppose the hand of Ammonius. Boethius is still in accord with Nicomachus:[99]

> τῶν μέν γε ἐντατῶν αἱ τάσεις αἱ μείζονες καὶ εὐτονώτεραι μείζονας καὶ ὀξυτέρους φθόγγους ἀπεργάζοναι, αἱ δ' ὀλιγώτεραι νωχελεστέρους τε καὶ βαρυτέρους. μεταστήσαντος γὰρ τὰς χορδὰς τοῦ πλήκτρου, ἀπὸ τῆς οἰκείας χώρας ἀφεθεῖσαι αἱ μὲν τάχιστά τε σὺν πολλῷ τῷ κραδασμῷ καὶ πολλαχοῦ τὸν περικείμενον ἀέρα τύπτουσαι ἀποκαθίστανται ὥσπερ ἐπειγόμεναι ὑπ' αὐτῆς τῆς σφοδρᾶς τάσεως, αἱ δὲ ἠρέμα καὶ ἀκραδάντως κατ' εἰκόνα τῆς τεκτονικῆς στάθμης.

The continuation of this claim, namely that the sound produced by a vibrating string, although perceived as continuous, is actually a discrete set of pulsations, is nowhere developed in Nicomachus' extant works. Boethius' example is a spinning top:[100]

> velut si conum, quem turbinem vocant, quis diligenter extornet eique unam virgulam coloris rubri vel alterius ducat, et eum qua potest celeritate convertat, tunc totus conus rubro

ὅπερ καὶ ἐπὶ τῶν μᾶλλον τεταμένων χορδῶν συμβαίνει. αἱ δὲ ἧττον τεταμέναι ἀνάπαλιν, οἷον ἡ ἡπάτη ἐν πολλῷ μὲν ἐκίνησεν τὸ διηχὲς τοῦ ἀέρος, ἐπ' ὀλίγον δ' ἐφύλαξεν. It is clear from the larger context, however, that Philoponus is thinking primarily in terms of 'velocity' not 'frequency of vibration' as the pitch determinant, e.g., *In de An.* 373.21–23: οὕτως οὖν καὶ ἐπὶ τῶν ψόφων ὀξὺν μὲν λέγομεν τὸν ταχέως παραγινόμενον ἐπὶ τὴν αἴσθησιν καὶ ἐπιμένοντα, βαρὺν δὲ τὸν ἀνάλογον τῷ ἀμβλεῖ τὸν βραδέως παραγινόμενον ἐπὶ τὴν αἴσθησιν καὶ ταχέως ἀποπαυόμενον. Philoponus' point, then, in the 'parallel' adduced by Wittmann is that a tighter string, such as the *nete*, will more rapidly affect the sound-conducting medium of air (το διηχὲς τοῦ ἀέρος) than does a more slack string, such as the *hypate*. A later passage (374.3–5) not mentioned by Wittmann does discuss string vibration, but the point there concerns only the duration of the sound, not its pitch.

97 The full passage reads (Wittmann, *Vox atque sonus*, 132–133): 'Die Übereinstimmung ist verblüffend, doch leicht erklärt: Boethius war wie Johannes Philoponos in Alexandria Schüler des Ammonios; Philoponos hat nach eigener Angabe seine Aristoteles-Kommentare unter Verwendung von Mitschriften von Ammonios' Vorlesungen ausgearbeitet.'

98 *In de An.* 1.2–3; see the detailed discussion of Boethius and Ammonius on Aristotle's *Peri Hermeneias* in John Magee, "On the Composition and Sources of Boethius' Second *Peri Hermeneias* Commentary," *Vivarium* 48 (2010): 7–54.

99 *Harm.* 4 (243.18–244.1): In the case of stringed instruments, greater and tauter tensions produce larger and higher sounds, while lesser tensions produce duller and lower ones. For when the plectrum moves the string, they are displaced from their normal positions, and the tenser ones recoil with a powerful agitation and strike the air about them in many places, as though impelled by the vigorous tension itself, while the slacker ones recoil gently and without agitation, like a carpenter's plumb-line (trans. Barker, *Greek Musical Writings II*, 154).

100 *Inst. mus.* 1.3 (190.15–21): For instance, if someone should carefully fashion a cone, called a top, draw on it a single strip of color, say red or some other color, and then spin it as fast as he could, then the whole cone seems to be dyed red, not because it is really completely red, but because the speed of the red stripe overwhelms the uncolored sections and does not allow them to be seen.

> colore videtur infectus, non quo totus ita sit, sed quod partes puras rubrae virgae velocitas conprehendat et apparere non sinat.

This metaphor is not original to Boethius (witness the translator's gloss: *quem turbinem uocant*), and this 'particulate' perspective on sound, combined with the example of 'color blurs,' is found twice in Porphyry's commentary on Ptolemy's *Harmonics*: once in a fragment of Heraclides' *Eisagoge*,[101] and once in the extended quotation from the Peripatetic *De audibilibus*, which Porphyry attributes to Aristotle.[102] In the latter, we read that (803b) 'the impacts made on the air by strings are many and separate, but because of the smallness of the time between them the ear is unable to detect the gaps, and hence the sound seems to us single and continuous.'[103] The clarifying example that immediately follows (803b34ff.) is drawn from the visual domain of color: separate bits of color often seem to us to be joined together when they are moving quickly.[104] The color analogy in Boethius, however, is closer still to Heraclides (ap. Porphyry, *In Ptolemei Harm.* 30.28–31.2): 'For often when a cone is in motion, and there is on the cone one white or black spot, it appears that there is a circle on the cone of the same color as the spot. And again, if there is a single white or black line on the moving cone, the whole surface appears to be of the same colour as the line.'[105] Barker has argued that these sources still operate on the assumption of pitch determination through velocity, and not through frequency of impacts or pulses (since the latter is the indirect result of the former: a swifter velocity yields more frequent impacts).[106] The *Sectio canonis*, however, argues the point directly: 'of motions, there are the more dense and the more rare. The more dense produce higher notes, and the more rare, lower.'[107] Boethius' presentation thus combines the pitch determination argument of the *Sectio canonis* with the top-metaphor as in the *De audibilibus* and Heraclides. As Nicomachus seems to have modeled his discussion of sound production on the *Sectio canonis*, and since the theory presented in 1.3 is entirely consistent with the theory of consonance attributed to Nicomachus at 1.31, it seems most economical to assume that Nicomachus is responsible for shaping the material,

[101] *In Ptolemei Harm.* 30.1–31.21.
[102] *In Ptolemei Harm.* 67.24–77.18.
[103] *αἱ δὲ πληγαὶ γίνονται μὲν τοῦ ἀέρος ὑπὸ τῶν χορδῶν πολλαὶ καὶ κεχωρισμέναι, διὰ δὲ σμικρότητα τοῦ μεταξὺ χρόνου τὴς ἀκοῆς οὐ δυναμένης συναισθάνεσθαι τὰς διαλείψεις, μία καὶ συνεχὴς ἡμῖν ἡ φωνὴ φαίνεται* (trans. Barker, *Greek Musical Writings II*, 107).
[104] See Gottschalk, "The *De Audibilibus*," 438.
[105] Trans. Barker, *Greek Musical Writings II*, 236.
[106] ibid., 107, n. 40 and 236, n. 110. For an opposing view, see Gottschalk, "The *De Audibilibus*."
[107] *Sec. can.* Intro. (114.6–8): *τῶν δὲ κινήσεων αἱ μὲν πυκνότεραί εἰσιν· αἱ δὲ ἀραιότεραι· καὶ αἱ μὲν πυκνότεραι ὀξυτέρους ποιοῦσι τοὺς φθόγγους· αἱ δὲ ἀραιότεραι βαρυτέρους.*

not Boethius. Thus, any similarities with *De anima* 2.8 or the Peripatetic tradition generally is due to the Peripatetic strand of thought that entered the Greek music-theoretical tradition of acoustics and not from any direct intervention by Boethius, as argued by Wittmann.

This sound is conveyed to the ears through the medium of the air in the manner of a wave, as Boethius explains in chapter fourteen.[108] Boethius' influential analogy of waves in a pool of water, probably taken directly from Nicomachus, originated in Stoic sources.[109] Just as circular waves are caused by a stone dropped into a pond, so the air when struck causes a sound in the immediate airy medium, and this then strikes the contiguous air and so on until the sound, propagated thus from its point of origin in a circle, reaches the ears. As with a wave, which weakens in proportion to the distance traveled, so too with sound, the intensity diminishes as the 'wave' propagates through the air and (occasionally) encounters obstacles. This metaphor proved particularly tenacious in medieval traditions.

3.4 Twelfth-century views on perception and hearing

According to the St. Florian commentator, Boethius' prooemium constitutes a *commendatio musicae*, and the *commendatio* is necessitated by the dubious status of sense perception (noted above).[110]

> Incipit a commendatione musicae. Quoniam enim musica a sensu inicium sumit et fere omne eius iudicium sensui committitur, sensus autem omnibus communis est, videretur mihi haec scientia quasi levis et vulgaris aliquam vilitatem et indignitatem indi sortiri. Commendat igitur musicam et hoc modo:...

Regrettably, the precise manner in which the St. Florian commentator construes the *commendatio* remains obscure, for the text that follows upon *et hoc modo* is (in Rausch's edition, at least) hopelessly

[108] *Inst. mus.* 1.14 (200.7–21): Tale enim quiddam fieri consuevit in vocibus, quale cum [in] paludibus vel quietis aquis iactum eminus mergitur saxum. Prius enim in parvissimum orbem undam colligit, deinde maioribus orbibus undarum globos spargit, atque eo usque dum defatigatus motus ab eliciendis fluctibus conquiescat. Semperque posterior et maior undula pulsu debiliore diffunditur. Quod si quid sit, quod crescentes undas possit offendere, statim motus ille revertitur et quasi ad centrum, unde profectus fuerat, eisdem undulis rotundatur. Ita igitur cum aer pulsus fecerit sonum, pellit alium proximum et quodammodo rotundum fluctum aeris ciet, itaque diffunditur et omnium circum stantium simul ferit auditum. Atque illi est obscurior vox, qui longius steterit, quoniam ad eum debilior pulsi aeris unda pervenit.

[109] See the parallels cited in Gottschalk, "The *De Audibilibus*," 445, fn. 3.

[110] *In inst. mus.* 23: [Boethius] begins with a commendation of music. Because music takes its beginning from sense perception and entrusts nearly its entire judgment to sense perception, and sense perception, moreover, is common to all, it would seem to me that this science, as though trivial and commonplace, would thereby acquire a kind of cheapness and indignity. Therefore he commends music in the following manner...

corrupt.[111] Nonetheless, it seems at least possible to reassemble the commentator's general intent from its larger context. The commentator frames the discussion by noting that *fere omne eius iudicium sensui committitur*, a claim which seems to run contrary to Boethius' own position – which, as we saw above, maintained a delicate balance between *sensus* and *ratio*. The commentator sees Boethius as turning (*retorquere*) music's seemingly greatest liability (its close connection to sense perception) into its strongest recommendation. Why? Because it is precisely the connection to sense perception that associates music with morality. We'll take up this line of argument in more detail in the next chapter.

The St. Florian commentator recognizes the ambiguity built into Boethius' opening words: *perceptio sensuum*, the commentator notes, can be understood in two different ways, either as signaling that we grasp or possess sensation (*sensum percipimus, id est habemus*),[112] or as indicating that we comprehend things by means of sensation (*percipimus sensu, id est per sensum aliqua comprehendimus*).[113] According to the commentator, this ambiguity is intentional, for Boethius intends, and in fact pursues, both meanings.[114] The second sentence continues the ambiguity:[115]

> SED COGNITIO EORVNDEM, scilicet sensuum, AC, pro scilicet, FIRMA eorum PERCEPTIO, id est cognitio eorum, quae firma deberet dici, id est quam habent illi qui firmiter rerum naturas investigant, scilicet philosophi. Quasi dicit: cognitio naturae vel ipsius sensus vel eorum, quae sensu percipiuntur, NON EQVE COLLIGITVR, id est non ab omnibus eque comprehenditur INVESTIGATIONE ANIMI, scilicet ratione et intellectu. Vel aliter: COGNITIO EORVNDEM, scilicet sensuum, AC FIRMA PERCEPTIO eorum quae sensu percipiuntur ita: natura sensuum vel natura eorum quae sensu percipiuntur, et est eadem sententia: NON EQVE etc.

[111] *In inst. mus.* 23: et hoc modo: licet enim sensus et ea, quae sensui subiacent, cognitio et natura, ad cuius investigationem maxime conspirat musica, ad eiusdem etiam maiorem commendationem, quae ad eius indignitatem videbatur pertinere, ad maximam eius commendationem retorquebit, hoc s. quod ipsa sensui coniuncta est.

[112] Cf. The paraphrase of Boethius' opening sentence in Adelard of Bath, *Quaest. nat.* xxiii (136): Omnium quidem habitudo sensuum, ut Boetius in Musica testatur, omnibus animalibus presto est, set que eorumdem sit vis quisve modus, non nisi intellectui philosophantis perspicuum est. Burnett (Burnett, *Conversations*, 231, fn. 39) misses the reference, suggesting that 'Adelard may be recalling inaccurately Boethius, *De Musica* 1.1, p. 179: "Adest enim cunctis mortalibus visus." '

[113] *In inst. mus.* 23.

[114] Et utroque modo hic debet intelligi, quia utroque modo exequetur (*In inst. mus.* 23).

[115] *In inst. mus.* 23: BUT THE UNDERSTANDING OF THOSE SAME THINGS, namely the senses, AND, meaning 'namely', THE FIRM PERCEPTION of them, that is the understanding of them, the sort of understanding that ought to be deemed firm, that is, the sort of understanding gained by those who firmly investigate the natures of things, that is, the philosophers. As if he should say: the understanding of the nature either of sensation itself or of things that are perceived through sensation IS NOT EQUALLY ADDUCED, that is, it is not comprehended equally by all, THROUGH THE INVESTIGATION OF THE MIND, that is, through reason or intellect. Or, understand this in another way: THE UNDERSTANDING OF THOSE SAME THINGS, namely the senses, AND THE FIRM PERCEPTION of those things which are perceived through sensation, meaning thus: the nature of the senses or the nature of those things that are perceived by the sensation. And the meaning remains the same, NON EQUALLY, ETC..

The commentator thus embraces simultaneously all the options ventured by modern translators: *eorundem* is *both* subjective and objective; *cognitio ac perceptio* are both parallel and divergent. As to the force of *non aeque*, the commentator follows the interpretation that had long been established in the margins of the text: *non aeque ab omnibus hominibus*.[116]

Boethius had explained the difficulty of understanding perception (in all the various senses of that phrase) with recourse to the example of sight. The St. Florian commentator seizes the opportunity to offer a digression on the nature of vision. The commentator correctly divides the two divergent accounts of vision – intromission and extramission – between Epicurus and Plato respectively. Epicurus thought that vision arose solely from the passive reception of objects: the eye is a flat, luminous body and thus it reflects, as if in a mirror, the image of the object opposite it.[117] To the contrary, Plato believed that a visible ray stretched out from the eye to the object. This ray is composed of a most subtle, nearly incorporeal substance, which, originating in the body, stretched through certain nerves to the windows of the eyes and emanated from the eyes (which it could penetrate because of its subtlety). As soon as it found an obstacle, because of its great agility, it was diffused over the whole surface of the object, and when it had acquired the image of the thing, it returned to the eye; whence in the eyes there arose images of the object opposite them.[118] The commentator then proves the existence of this *uisibilis radius* by offering an explanation of what happens when the ray encounters no obstacle, such as when we look at the sky. It this case, the ray reports back to the eye its own color. When we gaze into the open sky it appears to be blue, even though it is actually white, since the ray itself is blue (*videtur nobis, licet sit candidi diffinitum, esse blavii coloris, quia iste color proprius est visiblis radii*).[119]

[116] Bernhard and Bower, *Glossa maior* no. 40, I: 8.

[117] *In inst. mus.* 25: dixit enim quod oculus planum corpus est et luminosum. Et ideo tamquam in speculo resultat in eo ymago rei oppositae [*scripsi*, oppositione *Rausch*].

[118] *In inst. mus.* 25: Plato vero dixit quod visibilis radius dirigitur ab oculo in rem oppositam. Est enim visibilis radius quedam subtilissima substantia fere incorporea, quae in corpore existens per nervos quosdam ad fenestra oculorum dirigitur, et per oculum nimia subtilitate sibi penetrabilem egreditur, et quam cito invenit obstaculum nimia sui agilitate per totam obstaculi superficiem diffunditur, et ymaginem illius rei sortitus ex reverberatione redit ad oculum, unde in oculis quedam rei oppositae [*scripsi*, oppositione *Rausch*] resultant ymagines. Cf. *Guillelmi Glos. sup. Tim.* 137.25–31: Per haec ergo radius interior emissus, per oculorum fenestras exiens, admiscet se radio exteriori, acuendoque usque ad obstaculum ueniens, repercutitur et frangitur. Vnde naturali mobilitate per superficiem obstaculi diffusus, figuram et colorem obstaculi sibi assumit, quibus informatus et coloratus ad animam reuertens per oesdem oculos usque ad animam transit.

[119] *In inst. mus.* 25. Cf. William of Conches, *Phil.* 2.4 (58D–59A): Iterum dicent: 'Quid est ergo, quod ibi videmus spissum et aquei coloris? Ignis enim non est: si enim aer ex nimia sui subtilitate videri non potest, multo minus ignis, qui subtilior est. Deinde talis color igneorum non est.' Ad quod dicimus nihil ibi videri, sed visum ibi deficere et ex defectu visus quoddam spissum ibi confingere; cum enim radius ille interior, qui operatur visum, ad superiora dirigitur, nec est

When glossing *Inst. mus.* 1.9, the commentator notes that Boethius has made frequent mention of the senses throughout his various definitions of sound and consonance. Hence, the commentator worries that it may seem to some that the entire science rests upon sense perception. Thus, in this chapter, Boethius clarifies by demonstrating that while some matters are entrusted to sense perception, others are entrusted only to reason.[120] The commentator sums up the Boethian position: *Inicium enim est per sensum, sed per rationem consummatio*.[121] For when we hear that two sounds produce some consonance between them, we are (so to speak) admonished by the hearing to investigate the reason (*illam rationem*) why such sounds produce a consonance.

When he comes to gloss Boethius' definition of *sonus – percussio aeris indissoluta usque ad auditum* – the commentator carefully elucidates the incorporeal implications of Boethius' definition:[122]

> AERIS PERCUSSIO. Percussio [*scripsi*, percussam *Rausch*] dicitur, quia sonus nec est aer percussus nec eius actio aut passio, sed ex percussione facta ad aerem nascitur.

Sound is *aeris percussio*, not *aer percussus*. This is not a trivial distinction. The commentator has stepped here, *nolens volens*, into a ancient fray, which Aulus Gellius once described as a *uetus atque perpetua quaestio inter nobilissimos philosophorum* [...]: *corpusne sit vox an incorporeum*.[123] The debate pitted the materialist Stoics (and Epicureans) against everyone else (but, according to Gellius, principally the Platonists).[124] According to the Stoics, a *uox* must be a corporeal entity since causal interaction only obtains between bodies (though effects can be incorporeal).[125] The Stoic position

ibi obstaculum, quo repercutiatur, deficit et deficiendo spissatur; sed quia transit per oculum, in quo est aqueus humor et crystalleidos (ut de compositione oculi loquentes ostendemus), cum deficit nec alius color illi occurrit, talem, id est aqueum, sibi confingit.

[120] *In inst. mus.* 46: Quia omnia ista diffinierat faciendo mentionem de sensu, videretur alicui quod haec scientia tota sensui inniteretur, ideo hoc removet docens quod quedam quidem sunt, quae sensui committenda sunt, quedam vero, quae soli rationi.

[121] *In inst. mus.* 46.

[122] *In inst. mus.* 38: PERCUSSION OF AIR. It is called a percussion, because sound is neither percussed air nor is it an action nor a passion of air; rather, it arises from a percussion made against the air.

[123] *Noctes Atticae* 5.15. Gellius sizes up the combatants as follows: Sed vocem Stoici corpus esse contendun eamque esse dicunt ictum aera; Plato autem non esse vocem corpus putat; non enim 'percussus' inquit 'aer', sed 'plaga' ipsa atque percussio, id vox est.

[124] Cf. Adam Parvipontanus' example of a disjunctive question (*interrogatio electiua*) in the first category (the category *quid*) in his *Ars disserendi*, cxxxiii: Est ergo primi generis interrogatio electiva ut cum queritur 'an vox sit corpus' ut Stoicis visum est 'an non', ut Platoni (L. Minio-Paluello, *Twelfth-Century Logic. Texts and Studies I: Adam Balsamiensis Parvipontani Ars disserendi (Dialectica Alexandri)* [Rome: Edizioni di storia e letteratura, 1956], 86).

[125] E.g., Sextus Empiricus, *Aduersus mathematicos* 9.211: The Stoics say that every cause is a body which becomes a cause to a body of something incorporeal (εἴγε Στωικοὶ μὲν πᾶν αἴτιον σῶμα φασι σώματι ἀσωμάτου τινὸς αἴτιον γίνεσθαι). For instance the scalpel, a body, becomes a cause to the flesh, a body, of the incorporeal predicate 'being cut.' And again, the fire, a body, becomes the cause to the wood, a body, of the incorporeal predicate 'being burnt' (A.A. Long and D.N. Sedley, *The Hellenistic Philosophers*, 2 vols. [Cambridge: Cambridge University Press, 1987], I.333 (55B), with commentary at 340–341; Greek text at II.333).

predominated in grammatical contexts, and it provided the point of departure for Priscian's *Institutiones grammatici* (1.1.1): *Philosophi definiunt vocem esse aerem tenuissimum ictum*. The debate raged on in the twelfth century, largely in the grammatical tradition, and it is likely the grammatical tradition that the St. Florian commentator had in his sights.[126] His claim that *sonus* is *nec actio aut passio* may reply to a grammatical strand of thought that held precisely such a position. For instance, an unedited, mid-twelfth-century commentary, included in a compendium of grammatical and logical texts (Vienna, Österreichische Nationalbibliothek, VPL 2486, ff. 17r–35r), offers a collection of views on the status of *uox*, among which we find a view that corresponds precisely to St. Florian's criticism:[127]

> Alii dicunt quod vox est actio vel passio, quia percussio aeris est actio vel passio et percussio aeris est vox; ergo vox est actio ⟨vel passio⟩ [*scripsi*].

Regrettably, the St. Florian commentator offers us little more than a negative assessment of the *uox*: it must not be conflated with its medium (air), nor is it an *actio* or *passio* of the air. Whether the St. Florian commentator thus held that sound was a quality or quantity (the two other options discussed at length in the grammatical tradition), he does not say. But his conclusion, that 'sound arises from a percussion made against the air' (*percussio facta ad aerem*) corresponds to what William of Conches, in his *Glosulae de Magno Prisciano, Versio Altera*, deems a *diffinitio data per causa*. William's example of such a definition invokes (without naming his source) Victorinus' example of a *aitiologika definitio*: *dies est sol lucens super terram*.[128] Such a definition requires that the whole *definitio* be predicated of the *diffinitum*, and not just some part of it. Just as we cannot claim, on the basis of the definition *dies est sol supra terras*, that *dies est sol*, so too it does not follow from *uox est aer tenuissimus ictus* that *uox est aer uel corpus*.[129] The brief discussion and conclusion offered by the St. Florian

[126] Cf. the grammatical interpretation of the definition of Boethius' *casus uocis in unam intensionem*: vocis autem casus dicitur, id est vocis inflexio, quia sicut in inflexione, id est terminatione, dictionis fere omnem eius noticiam accipimus, sic in fine vocis agnoscimus utrum sonus ad musicam consonantiam aptus vel non (*In inst. mus.* 44).

[127] Vienna, VPL 2468, f. 18r; qtd. from L.M. De Rijk, *The Origin and Early Development of the Theory of Supposition*, vol. II.1 of *Logica Modernorum: A Contribution to the History of Early Terminist Logic*, Wijsgerige teksten en studies 16 (Assen: Van Gorcum, 1967), 238; for a description of the manuscript, see ibid. 89–91.

[128] Victorinus, *Liber de definitionibus*: Quinta decima species est definitionis aitiologike, Latini secundum rei rationem vocant, ut 'dies est sol supra terras', 'nox sol sub terris', ut enim aut dies aut nox sit, causa est aut supra terras sol aut sub terris (Andreas Pronay, *C. Marius Victorinus, Liber de definitionibus: eine spätantike Theorie der Definition und des Definierens* [Frankfurt am Main: P. Lang, 1997], 28.13–29.2).

[129] Qui tenent hanc sententiam [sc. uocem non esse aera nec corpus] aiunt hanc diffinitionem datam esse per causam, uelut ista est: 'dies est sol lucens super terram.' Sed diffinitionis datae per causam haec est natura quod tota simul de diffinito ponitur, non tame partes illius. Verum est enim quod dies est sol lucens super terram, non tamen dies est sol. Similiter uox est aer tenuissimus ictus, quia talis aer est causa uocis, nec tamen inde sequiter quod uox sit aer uel corpus. Oddly,

commentator on the nature of *sonus* bears a close connection to the grammatical and logical discussions of *uox*,[130] and it indicates a cross-pollination between the grammatical tradition and the musical tradition regarding the ontological status of *sonus* and *uox*. It is thus worth examining the various grammatical and logical discussions to see what light they can shed on the ontological status of the musical *uox*. But first a word of caution: even if the traditions overlap in significant ways, we cannot assume the semantic stability of *uox* across multiple domains. The *uox*, for instance, of Boethius' *De institutione musica* is not the same thing as the *uox* of the *De interpretatione* commentaries, and to assume naïvely an identity relationship between them will inevitably lead to misunderstandings.[131] The point of contact that will be explored and exploited in the following remarks focus on the phonetic core of the spoken *uox* – i.e., *uox qua* sense-perceptible *sonus*, regardless of its semantic force.

3.5 *Vox, sonus, et auditus apud grammaticos*

Twelfth-century discussions of the ontology of *uoces* are deeply indebted to an earlier (late-eleventh- and early-twelfth-century) tradition of glosses on Priscian, known collectively as the *Glosulae*.[132] The *Glosulae* organizes its opening discussion of *uox* according to the Aristotelian categories, each with arguments pro and contra: *uox* is (1) substance (*aer ictus*), (2) quality (*percussio aeris*), or (3) quantity (on the authority of Aristotle – *dicit enim Aristoteles in quantitate orationem esse*).

A *uox*, according to the first solution, is not simply in the category of substance as a species of substance. For in answer to the question, 'Is a *uox* so defined [as *aer tenuissimus ictus*] a species of air? i.e., does it signify some universal thing that would be a species in the category of substance?', the

Margaret Cameron deems this line of interpretation a 'modified corporealist view' (Margaret Cameron, "William of Champeaux and Early Twelfth-Century Dialectic" [PhD Thesis, University of Toronto, 2005], 83). The commentators, however, uniformly agree that this explanation is proffered by those who *reject* the corporealist view; it is a way to evade the corporealist implications of Priscian's definition.

[130] E.g., compare the St. Florian commentator's remark *sonus [...] ex percussione facta ad aerem nascitur* with the *Compendium Logicae Porretanum* by a disciple of Gilbert of Poitiers: *at hic sonus nec aer est neque percussio, sed ex collisione solidi ad aerem vel ad solidum nascitur*.

[131] For instance Blair Sullivan, "*Nota* and *notula*: Boethian Semantics and the Written Representation of Musical Sound in Carolingian Treatises," *Musica disciplina* 47 (1993): 71–97, constructs a unconvincing theory of 'musical semantics' that assumes the stable identity of *uox* across Boethius' musical and logical writings.

[132] For an introduction to the tradition and the scholarship, see Irene Rosier-Catach, "The *Glosulae super Priscianum* and its Tradition," in *Flores grammaticae: Essays in Memory of Vivien Law*, Henry Sweet Society Studies in the History of Linguistics 10 (Münster: Nodus, 2004), 81–99. The opening comments on *uoces* has been edited by Rosier-Catach in "Le commentaire des *Glosulae* et les *Glosae* de Guillaume de Conchessur le chapitre *De uoce* des *Institutiones Grammaticae* de Priscien," *Cahiers de l'Institut du Moyen-Age Grec et Latin* 63 (1993): 115–144.

commentator replies in the negative: 'We say that this is not the case.'[133] *Vox*, in fact, does not signify air essentially, but rather accidentally; however, *uox* must signify air in some respect, for if it did not, then the given definition would fail to be a *substantialis diffinitio*.[134] Some (*aliqui*), however, attempt to refute such a definition – namely, *uox est aer* – by supposing that: *si uox est aer, et est corpus*.[135] Thus the fundamental conflict: on the authority of Augustine *nullum corpus individuale in eodem tempore totum in diversis locis reperitur.*[136] But on the authority of Boethius: *idem sermo totus et integer, cum omnibus scilicet suis elementis, ad aures diversorum pervenit in eodem tempore, quasi in diversis locis est*.[137] The *Glosulae* then attempts to salvage the authority of both (*salva utriusque auctoritate*) by interpreting the 'sameness' relation in Boethius' claim as a formal, not material, identity. 'For it is in fact true,' the *Glosulae* continues, 'that a *uox*, formally and not materially identical, fills the hearing of different people at the same time.' It cinches the argument by invoking the Boethian example of waves in water: 'for instance, a stone cast into water makes a circular ripple (*orbis*), and that circle, when it strikes the nearby waters, makes another, and that yet another, and in this way many circles, different in matter and location but identical in form, take their form from that first circle.'[138] The wave model thus provides the commentator with the primary rationale for the corporealist view:[139]

Eodem modo aer in ore loquentis naturalibus instrumentis formatus vicinos impellit aeres

[133] Rosier-Catach, "Le commentaire des *Glosulae*," 120: In primis quaerendum est an vox sic diffinita species sit aeris, idest significet aliquam rem universalem quae sit species in predicamento substantiae. Quod dicimus non esse.

[134] ibid.: Vox enim aeres in essentia sui, scilicet in hoc quod sunt aeres non significat, sed potius ex quadam accidentali causa, in hoc, scilicet, quod percussi sunt naturalibus instrumentis. Dicimus ergo hoc vocabulum 'vox' accidentale esse, id est sumptum a quadam qualitate, percussione videlicet, non secundum vocem, sed secundum signifationem. Non est ergo substantialis diffinitio praemissa si 'vox' aerem non significat.

[135] ibid.: Hanc diffinitionem aliqui putant se infringere hanc hypoteticam in suae rationis exordio ponentes: 'si vox est aer, et est corpus.'

[136] As Rosier-Catach points out (ibid., 120–121, fn. 22), this maxim had wide circulation under Augustine's name (according to Abelard, it is to be found in Augustine's 'in Cathegoriis') but it is not found in the *Paraphrasis Themistiana* (which was attributed to Augustine); there is only a weak parallel in the *De musica* (1.1).

[137] Closely corresponding to *In Categorias* 164D: Dicitur quoque commune quod ipsum quidem nullis diuisum partibus, totum uno tempore in singulos uenit, ut uox uel sermo ad multorum aures uno eodemque tempore totus atque integer peruenit. Oddly, both De Rijk – in a note to the parallel passage in Abelard's *Dialectica*: ac rursus ipse Boethius totam vocem et integram cum suis elementis ad aures diversorum simul venire perhibet – and Rosier miss the reference and assume that is an *ad sensum* echo of *Inst. mus.* 1.14. See De Rijk, *Petrus Abaelardus. Dialectica: First Complete Edition of the Parisian Manuscript*, 70, n. 2 and Rosier-Catach, "Le commentaire des *Glosulae*," 121, n. 23.

[138] ibid., 121: Est enim verum quod vox formaliter eadem et non materialiter in eodem tempore diversorum replet auditum, ut puta iacto lapide in aqua fit orbis, et orbis iste vinicas undas impellens alium orbem fact, et ille alium. Et sic multi orbes, materia quidem et loco diversi sed in forma idem [idem *scripsi*, idest *Rosier*], a primo illo orbe formantur.

[139] In the same manner, air shaped in the mouth of the speaker by the natural instruments strikes the nearby air and imparts upon it its own form. In this way it happens that a *uox*, identical in respect of its form, can be in the ears of different people [at the same time], but it is different in respect of its material, as the material consists of (so to speak) different airs. Therefore it can be the case that no body is found wholly in different places at the same time, and *uox* can be a body, and yet a *uox*, identical in respect of its form (i.e., a similitude of sound), is heard in different places at the same time. Boethius too posits the analogy of water in the prooemium to his *Musica*.

> et in sua afficit [*scripsi cum* Burnett, conficitur *Rosier*] forma. Ita fit ut vox eadem secundum formam sit in auribus diversorum, sed quantum ad materiam diversorum, ut ita dicam, aerum diversa. Potest igitur esse ut nullum corpus in eodem tempore totum in diversis habeatur locis, et erit vox corpus, et tamen ipsa secundum formam, id est soni similitudinem, eadem in eodem tempore in diversis auditur locis. Et hanc similitudinem de aqua ponit Boethius in prologo quem praemittit in Musica.

It must be noted, however, that the author of the *Glosule* seems to know the *De institutione musica* only secondhand, or at least was writing without directly consulting his copy of Boethius' musical treatise, for there is no reference to the waves *in prologo quem praemittit in Musica*; the analogy occurs only midway through book one (1.14).

The *Glosulae* then quickly dispenses with the qualitative and quantitative positions in quick succession. The *sententia* that *uox* is a quality is a simple misunderstanding of Boethius' statement (*In Perih.* II.4.18) that a *uox* is a *percussio aeris*. We must not suppose that this *percussio* belongs in the category of quality; it is, rather, simply another way of expressing the *sententia* already endorsed in the *Glosulae*, namely *aer percussus*.[140] Likewise, the quantitative position, held by those who adhere to the authority of Aristotle, arises from the equivocal understanding of the term *oratio*, which (the *Glosulae* claims) 'signifies one thing when in the category of quantity, but something quite different when it is subordinated to the *uox* in the category of substance.'[141] In the end, however, the *Glosulae* leaves the question open, admitting that whichever of the *sententiae* commentators may prefer, each can offer a suitable reply to the basic question: 'What does Priscian define?' when he defines a *uox* as *aera tenuissimus ictus*.[142]

The quantitative position is articulated most fully in the writings of Peter Abelard, who was compelled to think carefully about the *uox* in order to think even more carefully about the more pressing problem of universals. If Abelard were to argue that universals are *voces*, as he in fact does in his *Log-*

[140] Rosier-Catach, "Le commentaire des *Glosulae*," 123–124: Opponitur iterum praemissae diffinitioni, quae dicit vocem esse aerem, quod Boetius in secundo commento Perhermeneias dicit vocem esse aeris percussionem per linguam, quod is aeris percussio qualitati supponitur, vocem eidem supponi necesse est. Sed si quis diligenter dicta Boetii consideret, inveniet vocem qualitati non supponi. Non enim dicit vocem simpliciter esse percussionem, sed aeris percussionem, id est aerem percussum. Et est dictum ad expressionem.

[141] ibid., 124: Alii vero Aristotelis auctoritate muniti vocem in quantitate ponunt. Dicit enim Aristoteles in quantitate orationem esse. Sed in quo praedicamento est species, ibidem esse oportet genus ipsius speciei. Huic obiectioni sic respondetur quod illi equivocatione orationis decepti nesciunt illam vocem quae est oratio, aliud significare in quantitate, aliud quando subiicitur voci in substantia. Voces enim eaedem saepe et significant substantiam quodam respectu, et quantitatem alio respectu, ut 'corpus' ista vox.

[142] ibid., 127: Si autem quaeratur in alterutra sententia quid Priscianus hic diffiniat, potest congrue responderi: haec prolatio 'vox' (secundum hoc quod significat et et nominat omnes aeres naturalibus ictos instrumentis) uel hic aer, seu quantitas 'homo', et sic de singulis aliis per se seundum hanc proprietatem quod naturalibus percutiuntur instrumentis, uel qualitas illa a qua sumitur vox secundum hoc quod adiacet aeribus percussionem suscipientibus.

ica ingredientibus, then he needs to account for the fact that, in at least one reading (a tenacious and vocal reading at that), *voces* are things. Without addressing this line of interpretation, Abelard would end up looking much like the naïve vocalists, the very objects of his withering critique. Abelard, famously, changed his terminology to clarify his position: universals are not *voces*, but rather *sermones*. But even before the flight from *voces* to *sermones*, Abelard offered a set of sophisticated arguments, based on Aristotle's claim in the *Categories* that *oratio* is an accident in the category of quantity, that *uoces* are quantitative entities, quantitative measurements of air suitably struck.[143] Abelard's most developed discussion occurs in his *Dialectica*. After dispatching the *magna dissensio* over the meaning of *oratio* as a matter of mere verbal quibbling,[144] he gets down to business with a detailed and (perhaps surprisingly) often physical discussion of *oratio siue uox*:[145]

> Nunc autem attentius inspiciendum est quam aeris prolati quantitatem orationem sive vocem appellamus. Cum enim multae sint aeris quantitates ceteris rebus communes, quibus vel secundum numerum partium vel secundum tempus vel fortasse secundum lineas vel superficies vel corpora mensurantur, praeter has omnes in prolatione quamdam dimensionem ac quemdam tenorem habet, quem Priscianus spiritum vocat [*Inst. gramm.* 2.44], ex quo in prolatione tantum ac sono mensuratur, secundum hoc scilicet quod obtusum sonum vel clarum habet vel tenuem vel spissum vel humilem vel altum. Quos quidem tenores Aristoteles orationes appellat sive etiam fortasse voces, quas etiam significare voluit quando una cum aere ipso proferuntur.

Abelard thus makes a careful distinction between the substance of the *uox* (*aer percussus*) and an accident of this substance that he deems its *tenor*, which is an accident in the category of quantity. What we may perceive as the qualities of sound (that it can be dull, clear, thin, full, low, and high) are in fact reducible to the quantitative. Abelard asserts this view over and against the authority of *noster magister*, presumably William of Champeaux, who held the *sententia* that, 'properly speaking, only

[143] E.g., *LI* 2, 173.7–9: Est autem hoc loco oratio nomen cuiusdam mensurae aeris strepentis et sonantis, secundum quam eum auditu metimur.

[144] *Dial.* 66.23–27: sive enim tam aeres prolati quam eorum tenores voces vel orationes seu nomina vel verba vel syllabae vel litterae dicantur, seu tantum huiusmodi quantitatum commune nomen sit 'oratio', nichil impedit nec quicquam nominis impositione de naturali proprietate rerum mutaverit. Cf. *LI* 2, 174.11–12: Sed non est magna de controversia nominum quaesio, dummodo rei naturam teneamus.

[145] *Dial.* 66.28–67.4: Now we must carefully consider just how it is that we deem a quantity of articulated air an *oratio* or a *uox*. For although air has many sorts of quantity in common with other things as well – such as to be measured by the number of its parts, by time, or perhaps even by lines, surfaces, and bodies – in addition to all these, air has in its articulation a certain dimension, that is, a certain tenor, which Prisican calls 'spirit.' This can only be measured in the articulation and the sound, according to the fact that it, for instance, has a dull or clear sound, a thin or full sound, a low or high sound. Aristotle calls these 'tenors' *orationes* or perhaps even *uoces*, and he means that these are bearers of meaning when they are articulated together with the air itself. Cf. *LI* 2, 173.9–13: Nam praeter lineas vel superficies ceterasque mensuras, quas habet aereum corpus commnues cum ceteris corporibus, habet quandam propriam, quae mensuratur, dum sonat, tenorem vdelicet quandam ei adiacentem, qui modo maior, modo minor discernitur pro eo quod aer vehementius vel remissius percutitur.

the air is heard, sounds, and bears meaning,' and the 'tenors' would merely come along with the air, insofar as they are adjacent to the heard, meaningful air.[146] Abelard, however, pushes his view even further and makes a general claim that outstrips the requirements of his argument. The *tenor* is not just the semantic bearer of a *uox* (the minimal claim he needs for his argument to succeed), it is in fact the very thing that makes air perceptible to the senses as sound. In short, *tenor* is the proper form of air, and it is only qua its tenor that air is sense-perceptive (qua sound) at all, for air can convey all sorts of 'forms' that do not convey any sound (or, what is more important for Abelard, do not bear any meaning):[147]

> Sed iam et sic quamlibet ipsius aeris formam, ut colorem aliquem eius, audiri ac significare possemus confiteri. Nos autem ipsum proprie sonum audiri ac significare concedimus, qui, dum aer percutitur, in ipso procreatur, atque per ipsum aer quoque sensibilis auribus efficitur. Sicut enim ceteris sensibus formas ipsas substantiarum proprie discernimus atque sentimus, ut gustu ⟨sapores, odoratu⟩ [*scripsi*] odores, visu colores, tactu calores, ita quoque auditu proprie tenorem prolationis concipimus atque sentimus.

The *tenor*, defined in Abelard's glosses on the *Categories* as a *strepitus aeris* belonging to the category of quantity,[148] is thus the proper object for the sense of hearing, just as color is the proper object of vision, scents the proper object of the sense of smell, etc. But how is it, then, that the *tenor* is in fact quantitative; i.e., what is it that makes it a measurable *dimensio*? Vocal sounds, in Abelard's view, are ultimately reducible beyond the seemingly smallest elements, namely letters (deemed elements by analogy with the cosmological elements), for the articulation of a single letter *prolatio unius litterae*, viewed from the physical standpoint of a vocal sound, is not a *simplex* entity, but is in fact *ex pluribus partibus coniuncta*. Abelard explains:[149]

[146] *Dial.* 67.5–6: Nostri tamen, memini, sententia Magistri ipsum tantum aerem proprie audiri ac sonare ac significare volebat, qui tantum percutitur, nec aliter huiusmodi tenores vel audiri vel significare dici, nisi secundum hoc quod auditis vel significantibus aeribus adiacent.

[147] *Dial.* 67.8–15: But on this view [i.e., that of *noster magister*] we could grant that any form of the air, say its color, is heard and bears the meaning. We do, however, concede that, properly speaking, *sound* is heard and bears meaning, sound which is generated in the air when the air is struck, and through sound that air becomes sensible to the ears. For just as, in the case of the other senses, we properly discern and perceive the forms of substances – flavors by taste, scents by smell, colors by sight, and temperature by touch – so also we properly discern and perceive the tenor of an articulation by the sense of hearing. Cf. *LI* 2, 174.31–33: Et sunt nonnulli, qui solum aerem velint sonare, audiri, significare. Nos vero tenorem praecipue auditu discerni volumus et proprie significare.

[148] *LI* 2, 173.13–14: Hic autem tenor ipse est strepitus aeris, quem hoc loco Aristoteles quantitatem vocat.

[149] *Dial.* 67.24–31: When we articulate the sound of any one letter, we strike the air with our tongue into many tiny pieces, and each of these individually seems to have some sort of sound, although this sound is not discerned *per se*, just as it is not articulated *per se*. It is thus necessary that this sound be properly deemed the simple and indivisible sound, which consists in indivisible particles of air. The complete articulation of a single letter can be called indivisible only with regard to those parts that are articulated *per se*, namely the articulations of the letters called elements. Cf. *LI* 2, 174.14–19: Quod autem supra tetigimus, quosdam scilicet tienores indivisibiles esse secundum partes, non videtur verum. Si

> Cum enim cuiuslibet litterae sonum proferimus, plures aeres in minutissimas [*scripsi*, mitissimas *De Rijk*] partes lingua nostra percutimus, quae singulae quemcumque sonum habere videntur, licet per se non discernatur, sicut nec per se profertur. Oportet itaque huiusmodi sonum proprie simplicem atque indivisiblem appellari qui in indivisibili parte aeris consistit. Totam vero unius litterae prolationem non aliter indivisibilem dici nisi ad partes per se prolatas, utpote ad aliarum litterarum prolationes, quas elementa nuncupant.

In his glosses on the *Categories*, Abelard appeals to Macrobius to support his thesis that the *tenores* – quantitative entities composed of many 'particles' of sound – are the proper objects of hearing and not the air.[150] Macrobius discussed the generation of sound in the context of the *musica caelestis*, and he argues that the violent collision of two bodies naturally results in the production of sound.[151] According to Abelard, the authority of Macrobius thus supports the view that a sound is something other than the bodies that collide to produce it (which, in the case of a *uox*, would be *lingua et aera*). This 'something' is Abelard's 'tenor':[152]

> Macrobius etiam huic plane consentire videtur, ut ipsum tenorem sonum appellemus, non aerem, ubi videlicet de motu planetarum loquens sonum fieri dicit ex duorum corporum violenta collisione, qui diversus est a collisis corporibus. Ex quo et illud convincitur, quicquid ex collisione linguae et aeris factum sonat, diversum esse tam ab aere ipso quam a lingua. Id vero est tenor qui aerem in prolatione mensurat. Si quis tamen aerem quoque audiri dicat vel significare, fortassis concedi poterit, sicut et corpus cum colore ipso videri dicimus, sed praecipue tenorem significare.

Committing, as Abelard does, to a quantitative view of *oratio* or *uox* does not, however, remove the same problem that taxed other commentators on Priscian, namely how can a single *uox* reach

enim proferam 'a' vel quodlibet literale elementum, quod individuam vocem Priscianus vocat, non videtur tenor vocis individuus, quippe plures simul aeris partes sicut percuti, ita etiam quantulumcumque sonum habere videntur, licet auditus eos non distinguat neque discernat.

[150] Abelard was not the first to turn to Macrobius for support. The *Glosulae* already noted Macrobius' relevance to the quantitative position: Sed primum quid vox in quantitate tantum posita significet videamus. Auctores huius sententie ex rationibus Macrobii qui de planetarum motu loquens, sonum ex duorum corporum violenta collisione fieri dicit, confirmant vocem significare quendam sonum ex aere confectum et lingua (Rosier-Catach, "Le commentaire des *Glosulae*," 125).

[151] *In Som. Scip.* 2.1.5 (95.3–96.4): ex ipso enim circumductu orbium sonum nasci necesse est, quia percussus aer ipso interventu ictus vim de se fragoris emittit, ipsa cogente natura ut in sonum desinat duorum corporum violenta conlisio. Cf. 2.4.2–3 (107.17–23): diximus numquam sonum fieri nisi aere percusso. ut autem sonus ipse aut actuior aut gravior proferatur, ictus efficit qui dum ingens et celer incidit acutum sonum praestat, is tardior lentiorve, graviorem. indicio est virga quae dum auras percutit, si impulsu cito feriat, sonum acuit, si lentiore, in gravius frangit auditum.

[152] *LI* 2, 174.37–175: Macrobius also clearly appears to agree with this view – namely that we call sound the tenor, not the air – where, when he speaks of the motion of planets, he says that sound arises from the violent collision of bodies, which is something quite apart from the bodies that have collided. Hence it is clear that, whatever it is that sounds when there is a collision of tongue and air, it is something other than the air itself or the tongue itself. This, of course, is the 'tenor', which measures the air in its articulation. If someone should yet claim that it is the air that is heard or that bears the meaning, perhaps that could be conceded, in the sense that we say that a body is seen together with its color, but it is still the tenor that is the primary meaning bearer.

the ears of different listeners at the same time.[153] Abelard gives two possible answers, and the second, according to Abelard, is a *physica consideratio*, namely the Boethian wave model. Yet Abelard does not interpret the transmission of the *forma* as a matter of identity (as in the *Glosulae*); rather, he consistently deems the form that is transmitted via the 'undulation' of the air only a *consimilis forma*:[154]

> Illi autem qui audiri nolunt nisi praesentia, hanc in voce physicam considerant quod quando lingua nostra aerem percutit sonique formam ipsi nostrae linguae ictus attribuit, ipse quidem aer cum ab ore nostro emittitur exterioresque invenit aeres quos percutit ac reverberat, ipsis etiam quos reverberat, *consimilem soni formam* attribuit illique fortasse aliis qui ad aures diversoum perveniunt. Unde etiam Boethium dicunt in libro musicae artis ad huiusmodi naturam similitudinem de lapillo misso in aquam adhibuisse [...] Sic vocem non secundum essentiam, sed secundum *consimilem formam* eamdem ad aures diversorum essentialiter venire quidam contendunt.

3.6 *Vox, sonus, et auditus apud physicos*

In Adelard of Bath's *Quaestiones naturales*, the full complex of arguments regarding the *uox*, which (as we have seen) were drawn from 'Augustine', Boethius' logical commentaries, as well as the wave model of the *De institutione musica*, are foisted upon the *De institutione musica* alone:[155]

[153] *Dial.* 70.15–19: At vero quomodo vel ipsa quantitas vel ipse aer in diversis locis simul esse poterit? Quae enim individua sunt, in diversis locis esse auctoritas negat atque in hoc ab universalibus separat, quae simul in pluribus reperiuntur.

[154] *Dial.* 70.36–71.12: Those who think that only things present [to the ears] are heard consider this physical matter regarding the *uox*, that when our tongue strikes the ear and the blow of our tongue bestows on the air a sounding form, that same air, as it is emitted from our mouth, comes upon [particles of] air, which it strikes and causes to reverberate, and it too bestows on the reverberating [particles of] air an entirely similar (*consimiles*) sounding form, and those perhaps on still more particles, which reach the ears of different listeners. Thus they contend that a *uox*, the same not according to its essence but according to its entirely similar form, essentially reaches the ears of different listeners. Cf. *LI* II, 176: Aer itaque oratione emissus et sonans alios aeres percutit eisque *consimiles* sonus confert, qui circumque diffusi ad aures diuersorum ueniunt et ita audiuntur. Unde Priscianus de uoce agens, 'ipsa,' inquit, 'tangit aurem' et Boethius in Arte musica dicitur ad naturam uocis demonstrandam conuenientem similitudinem inducere de lapillo proiecto in aqua, qui dum aquam percutit, quam inuenit, ipsa statim aqua percussa, dum in orbem diffunditur, orbicularem formam assumit undisque aliis quas ad ripas impellit, *consimilem formam* attribuit, dum ipse quoque in orbem diffunditur. Sic et aer aerem impellit et consimilem sonum ei confert, qui diffusus ad aures diuersorum peruenit per partes, quae singulae *consimilem sonum* habent, et ita ⟨a⟩ diuersis adstantibus uox eadem, id est *consimilis in sono*, audiri dicitur et ad aures diuersorum peruenire.

[155] *Quaest. nat.* 21 (Burnett, *Conversations*, 130): But Boethius explains his opinion in the Music in this way: since sound is made up of air, but air is a body, and one and the same body taken on its own cannot be complete in different places at the same time, thus the same sound cannot be simultaneously in the ears of different men. To explain how this can happen, he therefore has to add that: 'The air is formed by the mouth of the speaker and propelled by the tongue. It then shapes the air closest to itself with the same form, and the second [parcel of] air shapes the third, and the third the fourth, and so on until it reaches the ears of the bystanders. Thus they hear similar [parcels of] air, but not the same.' Hence the same Boethius adds as an illustration the throwing of a stone into water and the formation of circles (trans. ibid., 131).

> Sed hec eius sententia in Musica ab eodem [*sc*. Boetio] sic exposita est ut cum vox aer sit, aer autem corpus, corpus vero individualiter idem et unum in diversis locis eodem tempore totum esse non conveniat, sic eadem vox in diversis auribus hominum simul esse non possit. Subdit igitur quodmodo esse possit, dicens: 'Aer quidem ore loquentis formatus linguaque impulsus proximum sibi eadem forma afficit aerem, et secundum tercium, tercius quartum, itaque usque ad aures astantium. Sicque similes non eidem audiuntur aeres.' Unde et idem Boetius exempli similitudinem in iactu lapidis circulorumque formatione subdit.

As Charles Burnett has convincingly demonstrated, Adelard here is, in fact, closely reliant upon the *Glosulae*.[156] Adelard's 'Boethian' summary of the *Glosulae* was in turn picked up by William of Conches in his *Dragmaticon*.[157] William of Conches' *Glosulae de Magno Prisciano (Versio altera)*, however, offers a richer compendium of perspectives on the *essentia uocis*.[158]

William's *Glosulae super Priscianum* is set in motion by the creative force of *artifex natura*. The causal chain from *natura* to *grammatica* runs as follows: (1) Every living being requires heat to live; hence the need for hot organs in the midst of the body (the heart, liver, and gallbladder). But (2) since excess heat can be harmful, a cooling mechanism is required, namely organs expressly designed to draw in cool air (the lungs and windpipe). But (3) once indrawn, this cool air would quickly heat up; thus a continuous circulation of cool air is necessary. But (4) often, in the midst of this respiratory process, the air is struck on the way out by the mouth's natural instruments (the tongue, teeth, etc.); this results in a particular kind of sound, a *uox*. William continues:[159]

[156] Burnett, "Adelard, Music, and the Quadrivium," 175–180.

[157] Cf. *Drag*. 6.21.1–2: Dicit Boetius auditum fieri sic: aer naturalibus instrumentis percussus in ore loquentis formam quandam accipit. Qui exiens particulam aeris, quam tangit, simili forma informat et illa aliam, donec ad aures, quae ad modum tympani sunt concauae, perueniat. Quo in earum concauitate resonante excitatur anima, emittit que quandam partem praedictae aereae substantiae per neruos, qui a medio cerebri hinc et inde usque ad aures extenduntur. Quae tangens aera quem in aure reperit simili forma informatur, cum qua ad animam in logistica cellula recurrit. Ibi anima figuram nostrae uocis perpendit, et fit auditus. Ad quod demonstrandum inducit idem Boetius tale exemplum: lapis proiectus in medio stagni facit breuissimum circulum, qui impellens undas facit laxiorem circulum, et ille alium; et hoc fit donec uel ad ripas peruenerit uel impetus defecerit. Diuersae igitur particulae aeris, sed simili forma informatae, sunt in auribus diuersorum. Dicitur tamen eadem uox ibi esse propter expressam similitudinem. Cf. *Guillelmi Glos. sup. Tim.* 152; *Phil.* 4.28 (PL 172, 97AB).

[158] William's gloss to *Inst. gramm.* 1.1.1–2 has been partially transcribed in Rosier-Catach, "Le commentaire des *Glosulae*," 135–144, but the usefulness of her transcription is vitiated by frequent transcription and construal errors. All citations of William's *Glosulae de Magno Prisciano (Versio altera)* are drawn from my own edition of the text (printed below as Appendix I), which has been fully collated with Rosier's transcription.

[159] But it often happens that the air we emit is struck within the mouth by natural instruments and is formed into different shapes. This formed air, as it exits the mouth, touches the air proximate to the mouth and informs it with a similar form, and this propulsive process continues until the air, formed in the same way, strikes the ears of anyone standing within earshot. The soul, roused by this percussion, emits a certain airy substance, deputized for this very purpose, through certain nerves to the ears. This airy substance, when it touches the exterior air, is impressed with a similar form, and it returns to the soul with this form, in which the soul comprehends the intention of the speaker. Thus Boethius, in his book on music, shows how a *uox* is formed through the example of a stone cast into a pool of standing water. The stone makes a very small circle, and this circle, by striking the nearby water, makes a broader circle that in turn makes another circle (and so on) until it reaches the bank. Air, therefore, which has been struck in the way I've described and when it is formed by that striking, is a *uox*.

> Conti⟨n⟩git uero saepe quod aer qui emittitur naturalibus instrumentis in ore percutitur et in diuersas figuras formatur. Qui formatus, ab ore exiens, aera ori propinquum tangens, simili forma informat, et sic impellendo fit donec feriat aer sic formatus aures circumstantium. Qua percussione anima excitata quandam aeriam substantiam ad hoc deputatam per quosdam neruos ad aures emittit. Quae tangendo aera exteriorem simili forma imprimitur, cum qua uenit ad animam et in ea anima uoluntatem loquentis perpendit. Sic ostendit Boetius in musica formari uocem per similitudinem lapidis proiecti in medium aquae stantis, qui facit breuissimum circulum, qui impellendo uicinam ⟨aquam⟩ facit laxiorem circulum, et ille alium, donec ad ripam peruenerit. Aer igitur qui sic est percussus ex percussione formatus est uox.

There is little here that we have not already seen in the *Glosulae*, Abelard, or Adelard. William thus sides with the corporealists – 'therefore air, which has been struck in this way and takes form from the percussion, is a *uox*' – and only mentions in passing the competing views from the incorporealist camp. Some claim, he tells us, that sound is comparable to odor insofar as it is discerned in the air, but is not itself identifiable with the air. The incorporealists, however, disagree as to whether the *uox* is thus quality, quantity, or any one of the Aristotelian categories. William does not explain these views, but tersely promises: *sed de hoc alias dicetur*.[160] The corporealist camp, William notes, still has to deal with a fundamental aporia. William first invokes the same (pseudo-)Augustinian maxim encountered in the *Glosulae*: 'Augustine says that no body can be wholly present at one and the same time in different places.' This incontrovertible position, however, uncomfortably jostles the Boethian perspective on hearing, here represented not by Boethius' *In Catagorias*, but *Consolatio philosophiae* 2.p5.6: 'But Boethius says of the *uox* that one *uox* equally fills the hearing of many individuals.' Hence the aporia: 'if *uox* is air, and air is a body, how can it possibly stand that one and the same thing be in the ears of different individuals?'[161] In answer to this question, William puts his own stamp upon the tradition. William offers four responses, and each resolves the problem through differing approaches to either the ontological status of the *uox* or the perceptual process of *auditus*. What has not, however, been heretofore remarked is that William's solutions to the '*uox*-problem' often recapitulate *in nuce* the various solutions offered to the problem of universals – the similarities

[160] Sunt quidam qui propter praedictas obiectiones dicunt uocem non esse aera nec corpus, im⟨m⟩o quiddam quod in aere ipso auditu discern⟨i⟩tur, quemadmodum quiddam quod in aere odore discernitur. Qui tamen odor aer non est, sed in aere perprenditur. Similiter quiddam est quod in ipso aere auditu discernitur, sed quid sit illud – an qualitas, an quantitas – dissentiunt. Alii enim dicunt illud esse qualitatem, alli quantitatem, tertii dicunt neutrum, nec aliquid de praedicamentalibus. Sed de hoc alias dicetur.

[161] Dicit igitur Augustinus nullum corpus uno et eodem tempore totum potest esse in diuersis locis. Sed Boethius de uoce dicit, 'et uox quidem una pariter replet auditum multorum.' Si igitur uox est aer, et aer corpus, quomodo poterit stare quod ipsa sit in a⟨u⟩ribus diuersorum una et eadem?

between the solutions no doubt stemming from the similarity of the root problem, namely how it is that one thing can be wholly in diverse things at one and the same time. Of William's four solutions, two of them (1 and 3) closely map positions on universals, whereas the other two (2 and 4) are closely tied to theories of perception and the way that sound travels (or doesn't) from the source to the ears. Here, then, are the four solutions:

1. The *consimilis* theory: the same *voces* in the ears of different individuals are not completely identical (*non penitus eadem*) but only similar in all respects (*consimilis*), such that there is no perceptible difference between them (*ita quod nulla potest ibi perpendi differentia*). The negative formulation echoes the version of the indifference theory held by Abelard's master, William of Champeaux. One consequence of this view is that *uoces* are fundamentally non-repeatable – every *uox* is different (if imperceptibly so in the case of tokens of the same type). Even though this view, as William admits, has the apparent endorsement of Aristotle (*Cat.* 6.5a33–35: *dictum est et non potest amplus sumi*) and Horace (*Epist.* 1.18.71: *et uolat emissum semel irreuocabile uerbum*), William seems to have held it in little regard, and he excoriates a consequence of this position with his preferred derogatory slight, *confingere*:[162] *ideoque huiusmodi confingunt sententiam*. Although the precise *sententia* that William derides has been garbled by the scribe, it seems to have gone something like this: if *voces* are non-repeatable, then we can only describe the *euangelium* as *consimile*. William seems resistant to the idea that the Gospel is only identifiable with the sense of the words and not the words themselves.[163] It is possible that William here is taking aim at Abelard, who (as noted above) consistently characterized the *forma* transmitted to the ears as *consimilis*.

2. The extramission theory: *auditus* works like *uisus*, and thus the ears emit an airy substance (the *instrumentum audiendi*) that travels from the ears to the source of the percussed air (here the *os loquentis*), assumes the form that it finds there, and upon its return reports this form to the listener's soul (*formata forma quam reperit in aere percuss in ore, reuertitur ad animam.*

[162] Cf. *Guillelmi Glos. sup. Tim.* 127.18–20: Et nota quod non dicit ex qualitatibus elementorum humanum corpus constare, ut quidam garciones *confingunt*...; *Drag.* 3.5.1.9–11: Huius [sc. Aristotilis] sententiam super hoc [sc. super quintam essentiam] exponerem, nisi quosdam de nostris timerem, qui, coquina Aristotilis indigni, se esse illius filios confingunt.

[163] The questionable passage reads: Ideoque huiusmodi confingunt sententiam: neque aliquid euangelium nisi consimile. Non dicatur euangelium sensus uerborum. I have been unable to find any eleventh- or twelfth-century theory that holds that the *euangelium* is *non nisi consimile*.

Et sic audit anima). William, along with Adelard of Bath,[164] allows for this theory of hearing in special cases – namely, when a sound (a hiss or whistle: *sibilus*) is produced by a sharp intake of breath through terse lips. In this case, as William writes in the *Dragmaticon* (6.21.4), *dum sibilamus, stringendo labia aera attrahimus. Qui attractus uicinum sibi attrahit, et ille alium, donec illum qui est in auribus attrahat. Qui secum praedictum instrumentum usque ad os sibilantis attrahit; ibi forma accepta ad anima reuertitur, sicque sibilus auditur.*

3. The collection theory: infinite bits of air, when they share the same form (*eadem forma informati*), are said to be one and the same *uox*, although they are not the same *corpus*, just as infinite words (*infinitae dictiones*) are only one part of speech, even though they are not *una dictio*. Thus a *uox* is many bodies at once such that it is any one of them (*eadem uox est multa corpora ita quod unumquodque eorum*). William gives no indication as to whether he agrees or disagrees with this view.

4. The *circulus* theory: If a *uox* is transmitted like waves in a pool, then a *uox* is identifiable as the outermost circle of air in its entirety (*ille ultimus circulus aeris totus est una uox*). Part is in my ears and part in your ears. Each part, however, is coextensive with the whole, in that each part contains the entire form and meaning of the *uox* (*quia per partem illam possum totam formam uocis et signifcationem perpendere, dicitur tota in meis auribus uox est*). Whether or not William agrees that the *uox* is identifiable with the *ultimus circulus*, the Boethian model of sound propagation as akin to waves in water remained a fixed feature in William's account of hearing.

3.7 Appendix I: William of Conches, *Glosulae de Magno Prisciano (Versio altera)*, ad Prisc. 1.1.1–2 (de uoce)

1.1 ⟨P⟩HILOSOPHI DIFFINIVNT. Priscianus tractat⟨ur⟩us de sillaba, littera, dictione, quia in diffinitione litterae facturus erat mentionem de uoce sic: 'littera est minima pars uocis compositae', ne uideretur ignotum per ignotius diffinire, uel ne interru⟨m⟩peretur suus tractatus quaerendo 'quid est uox?', ante diffinit uocem, id est diffinitione ostendit cui conuenit esse uocem. Sed quoniam, cum sint quatuor

[164] *Quaest. nat.* xxi (132): Sicut enim, dum a me aerem impellendo formo, ad diversos diversi venientes sentiuntur, sic, dum ad me trahendo infra labia eum illido, a diversis per attractionem venientes ab eis a quibus veniunt sentiuntur.

species uocis, de una sola illarum in hoc opere intendit, diuisiuas differentias uocis enumerat. Deinde binas ad constructiones specierum generi omni uocum adiungit, ut separet illam speciem uocis de qua intendit ab illis de quibus non intendit. Ad ultimum ethimologiam huius nominis, quod est uox, ponit. Sed antequam litteram exponamus, aliquid de essentia uocis dicamus.

Natura igitur artifex hic constituit ut nichil sine calore ceteris qualitatibus dominante uiuere possit. Etsi enim quidam homines dicuntur frigidi, non ideo dicuntur quin plus habeant caloris quam frigiditatis, sed quia plus habent frigiditatis quam naturalis hominum complexio exigit. Vnde natura in medio humani corporis tria calidissima membra – scilicet cor, epar, cistam fellis – constituit. Sed quoniam proprium est caloris se et alia, nisi aliquid habeant quo temperetur, consumere, huic morbo natura remedium contulit attractione frigidi aeris cui membra ad hoc conuenientia, uidelicet pulmonem et alterias, deputauit. Sed quoniam nullus tam aequaliter potest aera attrahere quantum temperamentum exigeret, item aer attractus cito calescit, fuit necesse ut ille expelleretur et alius frigidus attraheretur. Cum igitur aperitur pulmo, aer subtrahitur. Sed ⟨cum⟩ concluditur, emittitur. Et sic opus spirandi et respirandi perficitur. Conti⟨n⟩git uero saepe quod aer qui emittitur naturalibus instrumentis in ore percutitur et in diuersas figuras formatur. Qui formatus, ab ore exiens, aera ori propinquum tangens, simili forma informat, et sic impellendo fit donec feriat aer sic formatus aures circumstantium. Qua percussione anima excitata quandam aeriam | 3vb | substantiam ad hoc deputatam per quosdam neruos ad aures emittit. Quae tangendo aera exteriorem simili forma imprimitur, cum qua uenit ad animam et in ea anima uoluntatem loquentis perpendit. Sic ostendit Boetius in Musica formari uocem per similitudinem lapidis proiecti in medium aquae stantis, qui facit breuissimum circulum, qui impellendo uicinam ⟨aquam⟩ facit laxiorem circulum, et ille alium, donec ad ripam peruenerit. Aer igitur qui sic est percussus ex percussione formatus est uox. Sed huic sententiae quaedam philosophicae rationes uidentur obuiare, quaedam garcionicae oblatrare. Philosophicas igitur ponentes et eis respondentes, garcionicas postponemus.

5 de diuisiuis differentiis, uide BOETHIVS, *Porphyrii Isagoge translatio*, 'De differentia', et *In Isag.* II, 255.4–256.16; 259.1–260.5 23/26 BOETHIVS, *De institutione musica*, 1.14; ed. G. Friedlein, p. 200

6 separet *scripsi*, semper et *P* 9 calore *scripsi*, colore *P*, *Rosier* 10 non *scripsi cum Rosier*, nam *P* 13 et *scripsi cum P*, quod *Rosier* 15 alterias *pro* arterias 17 cum *suppleui cum Rosier* 21 anima *scripsi*, aer *P*, autem *Rosier* 23 anima *scripsicum Rosier*, animam *P* || uoluntatem *scripsi*, uolontatem *P* 25 uicinam *scripsi cum P*, intimum *Rosier* || aquam *suppleui*, *forsan* undam *coniciendum* 27 philosophicae *p. corr.*, philosophiae *a. corr. P* || oblatrare *scripsi cum P*, obla... *Rosier* 28 postponemus *scripsi*, preponemus *P*

Dicit igitur Augustinus nullum corpus uno et eodem tempore totum potest esse in diuersis locis. Sed Boetius de uoce dicit, 'et uox quidem una pariter replet auditum multorum'. Si igitur uox est aer, et aer corpus, quomodo poterit stare quod ipsa sit in a⟨u⟩ribus diuersorum una et eadem? Huic sic respondent quidam quod eadem uox dicitur esse in auribus diuersorum non quia penitus eadem sit, sed quia consimilis ita quod nulla potest ibi perpendi differentia. Sed secundum istos non potest una et eadem uox bis dici. Quod non habent pro inconuenienti, cum Aristoteles ⟨dicat⟩: 'dictum est et non potest amplius sumi', et Horatius: 'et uolat emissum semel irreuocabile uerbum'. Isti bene concedunt quod uox sit aer. Ideoque huiusmodi confingunt sententiam: neque aliquid euangelium nisi consimile. Non dicatur euangelium sensus uerborum.

Alii dicunt quod quemadmodum res quae uidetur non uenit ad oculos uidentium, sed radius exiens per oculos usque ad rem dirigitur, sic nec uox quae est aer percussus uenit usque ad aures sed anima per aures instrumentum audiendi, id est aeriam substantiam et substantialem, emittit usque ad os loquentium quae, formata forma quam reperit in aere percusso in ore, reuertitur ad animam. Et sic audit anima. Quemadmodum igitur dicitur 'res ista facta est in oculis nostris', ita dicitur 'uox ista est in auribus', quia auribus percipimus uocem istam. Non ergo ideo uerum quod idem corpus sit in diuersis locis.

Tertii dicunt quod infiniti aeres eadem forma informati sunt una et eadem uox, nec tamen idem corpus, quemadmodum infinitae dictiones sunt una pars orationis, nec tamen sunt una dictio. Ille ergo aer quem profero cum dico 'homo' est eadem uox quae et ille aer quem alius profer⟨t⟩ dicendo 'homo'. Est igitur eadem uox in auribus diuersorum non tamen idem corpus, quia eadem uox est multa corpora ita quod unumquodque eorum.

Alii dicunt quod ille ultimus circulus aeris totus est una uox neque totus est in auribus diuersorum, sed pars in nostris auribus, pars in tuis. Sed tamen | 4ra | quia per partem illam possum totam formam uocis et significationem perpendere, dicitur tota in meis auribus uox esse. Sic igitur nullum corpus est in diuersis locis, et tamen eadem uox dicitur esse in auribus diuersorum.

29 locum non inueni; cf. GVILLELMVS DE CONCHIS, *Dragmaticon*, 6.19.8: tunc unum corpus uno eodemque tempore totum in diuersis locis est, quod non posse esse Augustinus testatur. Et ABELARDVS, *Dialectica* 2.2.4 (de oratione), ed. de Rijk, 70.19–20 30 BOETHIVS, *Consolatio philosophiae*, 2.p5.6: et uox quidem tota pariter multorum replet auditum. 34/35 ARISTOTELES, *Catagoriae*, 6, 5a33–35 35 HORATIVS, *Epist.*, 1.18.71 42 Ps. 117, 23; Matth. 21, 42

31 aer *p. corr.*, ar *a. corr. P* || et *scripsi cum P*, in *Rosier* 34 cum Aristoteles ⟨dicat⟩ dictum est *scripsi*, cum ⟨ab⟩ Aristotele dictum est *Rosier* || dicat *suppleui* 39 oculos *scripsi*, occulos *P* || aer *scripsi*, ar *P* 41 reuertitur *p. corr.*, reuerstitur *a. corr. P* 43 percipimus *scripsi cum P*, percimus *Rosier* 45 informati *scripsi cum Rosier*, informata *P* 51 nostris *p. corr. P*

Illi qui dicunt quod eadem uox potest multotiens et a diuersis dici illi quod Aristoteles ⟨dicit⟩ – 'dictum est et non potest amplius sumi' – ita respondent Aristotelem non negasse quod dictum est posse iterum dici, sed iterum sumi, quia non potest digito demonstrari ubi et quomodo partes istius sunt sitae, quemadmodum in linea, superficie, et corpore. Illud uero Horatii – 'uerbum uolat inreuocabile' – non quia non possit iter⟨um⟩ dici, sed quia postquam dictum est semel, non potest contingere non fuisse dictum. Neque potest homo illud ad uoluntatem suam ne audiatur tegere.

Iterum contra hanc sententiam uidetur Boetius esse, qui dicit 'uox est percussio aeris', ⟨id est⟩ non est aer. Sed ad hoc est facilis responsio, si ita exponatur: uox est percussio aeris, id est aer percussus. Iterum quod Macrobius dicit – ut sonus ⟨fiat⟩ esse necessaria corpora quae collidantur, et ita corpora collisa non sunt sonus sed efficiunt sonum, et ita aer collisus non est sonus, igitur nec uox – uerum est. Igitur ubicumque sonus efficitur, duo sunt corpora quae colliduntur, quorum neutrum uox est, tamen tertium, aer scilicet medius, qui est uox. Sed dicunt cum aer uirga percutitur quod sunt duo corpora quae concurrunt, quorum nullus est sonus. R⟨espondetur⟩ quod diuersi aeres sunt, id est aeris particulae. Est enim quaedam pars quae in illa percussione uirga sola tangitur, nec est sonus. Alia est quae et uirga et alia parte aeris percutitur, et illa est sonus.

Hae sunt philosophicae obiectiones contra sententiam quae dicit uocem esse aera. Pueriles uero istae: si uox est aer, ergo est calida et humida, quia est aer calidus et humidus. Et si aer qui emittitur post esum gariophili uel cinari uel cinnamomi redolet, ergo uox redolet. Similiter, si et foetet. Item, si pulex saliat per medium aeris qui emittitur, an saliat per medium uocis. Et si nomen meum est uox et omnis uox est corpus, ergo nomen meum est corpus. Sed huiusmodi nugatoria garcionibus relinquimus. Dedignatur enim sermo sobrius ista resoluere.

Secundum hos ergo qui retinent hanc sententiam, littera sic exponitur. PHILOSOPHI non grammatici – non enim pertinet ad grammaticos sed ad phisicos uocem diffinire – DIFI⟨NIVNT⟩ VO⟨CEM⟩, dicentes illam esse AEREM. Sed quia aer iste exterior est aer sed spis⟨s⟩us nec tamen est uox, ad-

60/61 BOETHIVS, *Commentariorum in librum Aristotelis Perihermeneias secunda editio*, ed. Meiser, p. 4, 18 62/63 MACROBIVS, *Commentarii in Somnium Scipionis*, 2.1.5; ed. Willis, p. 95–96

54 aristoteles *scripsi cum P*, ar *Rosier* || dicit *suppleui* 55 respondent *scripsi*, responderet *P* 56 partes *scripsi*, parte *P* 57 uero *scripsi cum P*, uersus *Rosier* 60 iterum *scripsi cum P*, item *Rosier* || *post* aeris *add*. id est aer percussus, *postea cancellatum P* 61 *post* hoc *add*. quod, *postea exp. P* || facilis *scripsi*, fascilis *P* 62 iterum *scripsi cum P*, item *P* || fiat *scripsi*, ista *P* 65 aer *p. corr*., aer ar *a. corr*. *P* 68 *post* quae *add*. est *P* 69 sententiam *scripsicum Rosier*, sententia *P* 70 calidus *p. corr*., callidus *a. corr*. *P* 71 cinnamomi *scripsi*, cinamomi *P* || foetet *P*, fitet *Rosier* 74 dedignatur *scripsi cum Rosier*, designatur *P* 76 *pro* phisicos *forsan* philosophos *intelligendum* || uocem *bis repetitur Rosier* 77 aer *p. corr*., ar *a. corr*. *P*

dit: TENV⟨ISSIMVM⟩. Cum enim sit tenuis, fit tenuior dum attrahitur. Fit tenuissimus quia dicunt quidam philosophi | 4rb | ex hoc spisso aere homines non spirare sed tenuissimo et subtilissimo, qui ex superiori regione naturalibus instrumentis per poros huius spissi attrahitur, sed ex illo ex quo uiuunt uocem formatam. Sed quia hoc totum habet aer quem dormientes spiramus, addit: ICTVM. Determina: ictum naturalibus instrumentis, id est lingua, palato, dentibus, labiis, uel per se uel alio mediante. Et tunc nulla erit obiectio de aere percusso in ore, digito, uel ⟨de⟩ aere qui ab alio prius formato percutitur.

Sunt quidam qui propter praedictas obiectiones dicunt uocem non esse aera nec corpus, im⟨m⟩o quiddam quod in aere ipso auditu discern⟨i⟩tur, quemadmodum quiddam quod in aere odore discernitur. Qui tamen odor aer non est, sed in aere perpenditur. Similiter quiddam est quod in ipso aere auditu discernitur, sed quid sit illud – an qualitas, an quantitas – dissentiunt. Alii enim dicunt illud esse qualitatem, alii quantitatem. Tertii dicunt neutrum, nec aliquid de praedicamentalibus. Sed de hoc alias dicetur. Qui tenent hanc sententiam aiunt hanc diffinitionem datam esse per causam, uelut ista est: 'dies est sol lucens super terram'. Sed diffinitionis datae per causam haec est natura quod tota simul de diffinito ponitur, non tamen partes illius. Verum est enim quod dies est sol lucens super terram, non tamen dies est sol. Similiter uox est aer tenuissimus ictus, quia talis aer est causa uocis, nec tamen inde sequitur quod uox sit aer uel corpus.

VEL SVVM. Subiungit aliam diffinitionem uocis quae in hoc differt a priore, quod prior solis sonis qui ab animali proferuntur conuenit, sed ista omni sono quicumque sit ille. Continuatio: PHILOSOPHI dicunt VOCEM ESSE AEREM, ETC. Vel dicunt uocem esse SENSIBILE, id est sensu corporeo esse perceptibile. Sed quia hoc habet omne corpus quod est sensibile, nec tamen est uox, addit: AVRIVM, ac si dicat: quod aure sentitur. Sed quia auris aliquando sentit frigus ⟨et⟩ calorem, quod est commune sensibile omnium membrorum, addit: SVVM, id est quod ita aure sentitur quod nullo alio instrumento. Vnde exponit: ID EST QVOD PROPRIE A⟨VRIBVS⟩ A⟨CCIDIT⟩, ⟨id est⟩ conuenit.

ET EST PRIOR. Ostendit differentiam inter has duas diffinitiones, hanc scilicet quod prior substantialis, alia accidentalis. Et hoc est: PRIOR DIFFINITIO EST SV⟨M⟩PTA A SVBSTANTIA, id est constat ex

79 spirare *scripsi*, sprare *P* || qui *scripsi*, quod *P* 82 ictum *scripsi*, ictus *P*, a[ut] *Rosier* || lingua *scripsi*, linga *P* 86 odore *scripsi*, ad ore *P Rosier* 92 *post* simul *add.* est (et *Rosier*) *P* 95 solis *scripsi cum P*, solum *Rosier* 96 qui *scripsi*, quae *P Rosier* || proferuntur *scripsi*, profertur *P Rosier* 98 hoc *scripsi*, hic *P* || *post* habet *add.* animae, *postea exp. P* 101 accidit *om. Rosier* || id est *suppleui* 102 et est prior *om. Rosier* || prior *scripsi*, proprior *P* || ostendit *scripsi*, astra *(uid.) P*, *om. Rosier* || differentiam *scripsi*, differentia *P Rosier* 103 hoc *scripsi cum P*, hic *Rosier* || prior *scripsi*, proprior *P*

substantialibus, scilicet ex genere et differentiis. Vel EST SV⟨M⟩PTA, id est incepta, A SVBSTANTIA, id est a genere (uere enim genus est substantia suae speciei). Secundum illos qui dicunt uocem non esse aera sic exponitur istud: PRIOR DIFFINITIO SUMPTA EST A SVBSTANTIA, id est a causa (causa enim quodammodo est substantia effectus in hoc quod confert illi esse). ALTERA diffinitio est sumpta A NOTIONE. Sed quia genus dicitur notio, ut ibi: 'genus est notio ad plures differentias uel species pertinens', subiungit: QVAM notionem GRAECI VOCANT ENNOYAN (sola enim accidentalis notio ennoyan uocatur). | 4va | Vnde glosat: HOC EST assumpta AB ACCIDENTIBVS duobus, sensibile scilicet aurium et proprium. Vel ita: ALTERA diffinitio sumpta est A NOTIONE – sed ne uideretur talis descriptio contentibilis, commendat illam graeco nomine – QVAM, id est diffinitionem su⟨m⟩ptam a notione, GRAECI VOCANT ENNOYAN. Deinde glosat quid sonet 'ennoyan': HOC EST AB ACCIDENTIBVS. Inde enim talis diffinitio dicitur 'ennoyan', quod est sumpta ab accidente rei quae definitur.

ACCIDIT ENIM. Vere ista diffinitio sumpta est ab accidente, quia ab auditu. Idem enim est proprie aure sentiri et audiri. Et unde hoc 'si ab auditu, ergo accidenti'? Quia AVDITVS ACCIDIT VO⟨CI⟩. Et nota quod auditus potest dici actio audiendi. Iste non accidit uoci, sed animali. Et ita accipitur cum dicitur 'quinque sunt sensus corporis, uidelicet auditus, uisus, et cetera'. Item dicitur auditus passio quae inest rei inde quod auditur. Ita hic accipitur, et iste accidit uoci. Est igitur sensus: AVDITVS, id est audiri, ACCIDIT VOCI. Sed quia contingit saepe uocem non audiri, cum omnis sonus hic dicatur uox, subdit: QVANTVM IN IPSA EST. Si enim non auditur, non remanet in ipsa, sed deest qui illam audiat.

VOCIS AVTEM. Data diffinitione uocis, illius diuisiuas ⟨differentias⟩ enumerat ut ex istis iunctis huic generi, quod est uox, quatuor species uocis continuet, ut separet illam speciem uocis de qua intendit ab illis de quibus non intendit. Continuatio: tales sunt uocis diffinitiones. Vocis uero sunt quatuor differentiae diuisiuae: AR⟨TICVLATA⟩, INAR⟨TICVLATA⟩, LIT⟨TERATA⟩, ILLI⟨TERATA⟩. Et nota quod dicuntur diuisiuae differentiae non quia simul diuidant uocem, sed quia binae et binae sufficienter illam diuidunt. Omnis enim uox uel est articulata uel inarticulata. Similiter omnis est uel

108/109 CICERO, *Topica*, 31: genus est notio ad plures differentias pertinens

105 speciei *scripsi cum P*, specie *Rosier* 106 a *scripsi*, ab *P* 108 notio- *scripsi*, natio- *P hic et infra)* 109 uocant *P*, dicunt *iuxta editionem Hertzii* || ennoyan *scripsi*, annoyan *P* 110 ab *scripsi*, ad *P* 112 contentibilis *pro* contemptibilis 113 ennoyan *scripsi*, anoyan *P* || ennoyan *scripsi*, annoyam *P* 114 ennoyan *scripsi*, annoyan *P*, oenoyan *Rosier* 115 uere *scripsi cum P*, uoci *Rosier* 117 iste non accidit *scripsi*, ista non accidunt *P*, ista non accidit *Rosier* 124 continuet *scripsi*, continuat *P*, constituat *Rosier* 125 uocis *p. corr.*, uoces *a. corr. P* || diffinitiones *scripsi cum P*, diffinitionis *Rosier*

litterata uel illitterata. Sed quamuis binae quaelibet sufficienter uocem diuidant, non tamen species uocis perfecte constituunt. Et ideo non propter dictionem sed propter specierum constructionem quatuor differentias uocis apposuit.

ARTICVLATA. Diffinit articulatam uocem, id est diffinitione ostendit cui uoci esse articulatam conuenit. Etiam ethimologiam huius nominis 'articulata' interserit. Et hoc est: illa uox articulata QVAE PROFERTVR. Sed quia hoc habet omnis uox, ad remotionem aliarum subdit: COAR⟨TATA⟩. Quia coartare est et cogere et iungere, glosat: ID EST COPVLATA CVM ALI⟨QVO⟩ SEN⟨SV⟩ MEN⟨TIS⟩ E⟨IVS⟩ QVI LO⟨QVITVR⟩. Et est sensus: articulata est uox quae a loquente intentione significandi profertur. Sed INARTICVLATA EST illi (id est articulatae) CONTRARIA. Et determinat, id est QVAE PROFI⟨CISCITVR⟩ A NVL⟨LO⟩ AFFECTV MEN⟨TIS⟩, id est quae non profertur intentione significandi.

Et attende quod de significatione uocis aliter Priscianus, aliter sentit Boetius. Dicit enim Boetius uocem esse significatiuam quae in audiente | 4vb | generat intellectum siue proferens causa significandi proferat illam siue non, unde dicit latratus canum ⟨iras⟩ significare. ⟨Priscianus uero dicit uocem esse significatiuam⟩ quae causa et intentione significandi profertur, etsi auditor non intelligat aliquid per illam. Quaeritur cur articulata et inarticulata sint diuisiuae differentiae uocis et constitutiuae specierum illius et ita substantiales, cum eadem uox possit esse et articulata et inarticulata et cum eadem uox modo profertur intentione significandi ⟨(et tunc est articulata), modo sine intentione significandi⟩ (et tunc est inarticulata). Contra hoc dicunt quidam in rebus hoc esse inconueniens, in nominibus non, ut una et eadem uox est nomen et uerbum, et significat cum tempore et sine tempore. Alii dicunt quia uox, semel articulata et imposita ad significandum, nunquam postea est inarticulata. Illi sic exponunt diffinitionem: ARTICVLATA EST QVAE PROFERTVR, id est est pronuntiabilis, C⟨VM⟩ A⟨LIQVO⟩, ETC., INART⟨TICVLATA⟩ quae non profertur, id est non est pronuntiabilis, CVM ALI⟨QVO⟩ ⟨SENSV⟩ MEN⟨TIS⟩. Ista igitur uox, etsi a rustico causa significandi non profertur, iuxta hoc tamen

139/141 BOETHIVS, *Commentariorum in librum Aristotelis Perihermeneias secunda editio*, ed. Meiser, p. 54.24–26: Mutorum quoque animalium sunt quaedam uoces quae significent: ut canum latratus iras significat canum, alia uero mollior quaedam blandimenta designat.

133 etiam *scripsi cum P*, et iam *Rosier* 135 id *P*, hoc *iuxta editionem Hertzii* 136 a loquente *p. corr.*, alquente *a. corr. P* 137 illi *scripsi cum Rosier*, illa *P* || *post* quae *add.* non *P* 138 affectu *scripsi*, ff. *P* 141/142 Priscianus uero – esse significatiuam *conieci*, *om. M per homeoteleuton?* 142 quae *scripsi cum P*, quia *scripsit Rosier* || et *scripsi cum P*, id est *Rosier* 143 quaeritur *scripsi cum P*, quare *Rosier* || cur *scripsi*, cum *P* || diuisiuae *scripsi*, diuersae *P* 145/146 et tunc – intentione significandi *conieci* 149 pronuntiabilis *scripsi*, pronontiabilis *P* 149/150 cum aliquo *scripsi*, causa ⟨significandi⟩ *Rosier*

quod est apta significare articulata uocatur. Iterum attende quod Boetius in diffinitione interpretationis – ubi dicit 'interpretatio est uox articulata aliquid significans per se' – aliter intellexit 'articulata', id est ex articulis, scilicet ex litteris constans. Et tunc dicitur articulata ⟨ab⟩ articulo, sicque omnis uox quae constat ex litteris – siue significet siue non – dicitur articulata. Hic uero non dicitur articulata nisi sit significatiua et ab hoc homine prolata; solus enim homo mentem habet et loquitur. In hoc quod dicit 'coartata' habes ethimologiam huius nominis 'articulata', scilicet quod dicitur ab 'arto, artas'.

LITTERATA, ETC. Ostenso quid sit articulata et quid sit inarticulata uox, ostendit quid sit litterata et illiterata. Et hoc est: illa uox EST LITTERATA QVAE POTEST SCRIBI, id est figuris iam inuentis et usitatis repraesentari. Hic habemus Priscianum auctorem uocem posse scribi, quod tamen quidam gartiones negant. ILLITERATA est QVAE NON POTEST SCRIBI, id est figuris iam inuentis et usitatis repraesentari.

INVENIVNTVR. Demonstratis differentiis uocis subiungit qualiter ex eis coniunctis fiunt species uocis. Et notandum quod quotiens aliquod genus duobus modis diuiditur per aliquas differentias, iuncta una differentia unius diuisionis cum differentia alterius, quaedam species illius generis perficitur, ut in hoc genere articulata et litterata unam speciem uocis perficiunt, articulata et illiterata secundam, et litterata et inarticulata tertiam, inarticulata et illiterata quartam. Nunquam uero differentiae eiusdem diuisionis eandem speciem constituunt; sunt etenim oppositae. Continuatio: Quandoquidem praedictae differentiae hoc genus, quod est uox, diuidunt, ergo illius species constituunt. Et hoc est: INVENIVNTVR QVAEDAM AR⟨TICVLATAE⟩ et litteratae, deinde glosat, id est QVAE POSSVNT SCRIBI ET INTELLIGI. Sed inde quod possunt scribi, sunt litteratae, | 5ra | inde quod intelligi, articulatae, VT ista uox: ARMA VIRVMQVE CANO. Et est materiale impositum. Et hoc est prima species uocis. QVAEDAM inueniuntur QVAE NON POSSVNT SCRIBI et ita sunt illiteratae, tamen possunt intelligi et ita sunt articulatae. Et hoc est secunda species uocis, VT SIBILI HOMINVM. Latrones enim ad quendam affectum animi significandum sibi inuicem sibilant uel gemunt. Haec enim est commen-

152/154 BOETHIVS, *Commentariorum in librum Aristotelis Perihermeneias secunda editio*, ed. Meiser, p. 6.4–5: interpretatio namque est uox articulata per se ipsam significans 173 VERGILIVS, *Aeneid.* 1.1

152 iterum *scripsi cum P*, item *Rosier* 154 sicque *scripsi cum P*, sic quod *Rosier* 156 sit *bis repetitur P* || mentem *scripsi cum Rosier*, mente *P* 158 artas *scripsi cum P*, arto *Rosier* 159 ostendit *scripsi cum P*, ostenditur *Rosier* 165 *post* quod *add.* species, *postea exp. P* 168 litterata *scripsi*, illiterata *P* || differentiae *scripsi cum P*, diffentie *Rosier* 169 diuisionis *scripsi*, dictionis *P* 169/170 quandoquidem *scripsi cum P*, quando quidem *Rosier* 171 quae *scripsi*, quod *P Rosier* 173 species *scripsi*, speciem *P* 174 tamen *scripsicum Rosier*, quando *P*

I.2 datio exempli. ALIAE uoces SVNT, ⟨QVAE⟩, QVAMVIS SCRI⟨BANTVR⟩, id est sunt litteratae, TAMEN NICHIL significant, ⟨id est⟩ inarticulatae sunt. Et haec est tertia species uocis, ut COAX (uox ranae) et CRA (uox corui). Etsi enim augures in uoce corui aliquid perpendant – unde a ⟨Boetio⟩ significatiua uox naturaliter dicitur – tamen quia non profertur a coruo causa et intentione significandi, a Prisciano uox significatiua non dicitur. ALIAE SVNT INARTI⟨CVLATAE⟩ ET ILLITTERATAE, quae est quarta species uocis. Sunt igitur quatuor species uocis: articulata et litterata, articulata et illitterata, litterata et inarticulata, inarticulata et illiterata.

SCIRE, ETC. Ne aliquis putet quod praedictae differentiae praedictas species sine alio constituerent, dicit quod aduenientes huic generi, uoci, hoc faciunt. Continuatio: Non solum debemus scire quod hae differentiae constituunt has species uocis, AVTEM, id est sed, DEBEMVS SCIRE QVOD QVATVOR DIFFERENTIAE SV⟨PERIORES⟩, id est de quibus factus est sermo in superioribus, PERFI⟨CIVNT⟩ HAS QUATTVOR SPECIES VO⟨CVM⟩, non omnes singulas, sed BINAE aeque PER SIN⟨GVLAS⟩, id est in constitutione singularum et non per se sed ACCI⟨DENTES⟩, id est aduenientes, HVIC GENERI VOCI. Sed ne aliquis putet 'alicui uoci', addit: GENERALITER, id est aduenientes huic generi uoci has species constituunt.

'VOX' AVTEM. Post diffinitionem uocis et differentias et species, subiungit Priscianus huius nominis, quod est 'uox', ethimologiam geminam. Quarum prior plus concordat cum uoce, minus cum significatione; posterior minus cum uoce, plus cum significatione. Et est ethimologia, ut ait Cassidiorus, breuis oratio per certas significationes ostendens de quo nomine uel fonte uenerit illud de quo quaeritur nomen. Interpretatur tamen 'origo nominis'.

Continuatio: VOX EST AER TENVISSIMVS, ETC. Sed dicitur 'VOX' A VOCANDO non quia per omnem uocem aliquid uocemus, sed quia per quasdam. Sed ne uideretur mirum quod producta dictio a correpta deriuaretur, dicit per contrarium non esse mirum, cum correpta saepe deriuatur a producta, VT 'DVX' A DVCENDO. Deinde subiungit ethimologiam sic: VEL uox dicitur APO TOY BOO, id est ab hoc uerbo 'BOO' – et est APO ab, TOY articulus. Est igitur summa: 'Vox' dicitur ab

194/196 CASSIODORVS, *Expositio Psalmorum* 1.1 (CCSL 97, p. 30): Etymologia est enim oratio breuis, per certas associationes ostendens ex quo nomine id, quod quaeritur, uenerit nomen.

177 *post* tamen *add.* ⟨...⟩ *Rosier* 178 id est *suppleui* || coax *scripsi*, coars *P* 179 a boetio *scripsi cum Rosier*, alio *P* 186 constituunt *scripsi*, constitituunt *P* 188 aeque *P*, coeuntes *iuxta editionem Hertzii* 189 singularum *P*, singularium *Rosier* 190 huic generi *non in editione Hertzii* 192 diffinitionem *scripsi cum P*, deffinitionem *Rosier* 195/196 de quo quaeritur *scripsi cum P*, ⟨**⟩ quare *Rosier* 197 continuatio *om. Rosier* 198 omnem *scripsi*, orationem *P Rosier* || producta *scripsi*, praedicta *P Rosier* 200 toy *scripsi*, thoy *P*

hoc uerbo BOO, BOAS, quod est ‘sono, -nas’ (inde componitur ‘reboo, -as’, id est ‘resono, -as’) et fit inde mutata ‘b’ in ‘u’ consonantem et ultima ‘o’ in ‘x’. Haec ethimologia ad sensum plus pertinet. Quia enim omnis uox est sonus, merito a uerbo quod significat actum sonandi uox dicitur.

204 *post* actum *add*. significa., *postea exp. P*

CHAPTER FOUR

MVSICA HVMANA: ANTHROPOLOGICAL HARMONY

ἡ γὰρ δι' ὤτων εἰσρέουσα συμφωνία καὶ ἐν ἤχοις καὶ πληγαῖς ὑφισταμένη τῆς ζωτικῆς καὶ νοερᾶς ἐξήλλακται ('The concord that flows through our ears and consists in soundings and strikings differs entirely from the life-giving, noetic concord').[1] So explains Proclus, as he sets forth the principles that guide his elucidation of the *anima mundi*. Soul has only a noetic harmony: it is not corporeal (even if the Demiurge manipulates it as if it were – mixing it, cutting it, shaping it); it has no dimensions (even if the Demiurge measures it and divides it as if it did); and it is not quantitative (even if the Demiurge imparts to it a distinctly quantitative structure). Phenomenal harmony, however, is all of these – corporeal, dimensional, and quantitative – and yet Plato tells us (*Tim*. 47d2): *ἡ δὲ ἁρμονία, συγγενεῖς ἔχουσα φορὰς ταῖς ἐν ἡμῖν τῆς ψυχῆς περιόδοις*... ('harmony [has] movements that are akin to the periodic revolutions of soul within us'). The soul's harmonic structure is thus ultimately anagogic: through the medium of a lower reality (mathematical harmonics), it offers a way to conceive of higher ontological reality (the soul). In the words, again, of Proclus: *οὐ γὰρ ἐκ μαθηματικῶν ἀριθμῶν ἐστι καὶ λόγων ἡ οὐσία τῆς ψυχῆς, ἀλλ' οὗτοι πάντες οἱ λόγοι καὶ οἱ ἀριθμοὶ τὴν ὄντως οὐσίαν αὐτῆς ἀπεικονίζονται καὶ τὰς ἐν αὐτῇ διαιρέσεις τὰς δημιουργικάς τε καὶ ζωογονικάς* ('The being of soul does not consist in mathematical numbers and ratios, but all of these ratios and numbers are representations of the real essence of soul and the creative, life-giving divisions within it').[2] This chapter targets the role of harmonic language and mathematical structures in discussions of the human body and soul. If, as we have seen in the previous chapter, hearing is the result of a physiological process that has (at the very least) its origins in the realm of the corporeal, then the question still remains: how can the corporeal, material manifestation of music impinge upon and affect the incorporeal soul? The answer lies, at least in the late-ancient and twelfth-century worlds, in the realm of the Boethian *musica humana*, which encompasses the harmonic architecture of soul, body, and their conjunction. The canonical division of *musica humana* presented at *De institutione musica* 1.2, however, offers lit-

[1] Proclus, *In Tim.* II 195.15–17.

[2] Proclus, *In Tim.* II 212.5–9; on which see Marije Martijn, *Proclus on Nature: Philosophy of Nature and its Methods in Proclus' Commentary on Plato's Timaeus*, Philosophia antiqua 121 (Leiden: Brill, 2010), 195–201.

tle in the way of details. Whereas the description of *musica mundana* unfolded over more than 250 words (as we will see in the next chapter), and *musica instrumentalis* unfolds over the course of the full five (extant) books, *musica humana* is described in a mere 63 words:[3]

> Humanam vero musicam quisquis in sese ipsum descendit intellegit. Quid est enim quod illam incorpoream rationis vivacitatem corpori misceat, nisi quaedam coaptatio et veluti gravium leviumque vocum quasi unam consonantiam efficiens temperatio? Quid est aliud quod ipsius inter se partes animae coniungat, quae, ut Aristoteli placet, ex rationabili inrationabilique coniuncta est? Quid vero, quod corporis elementa permiscet, aut partes sibimet rata coaptatione contineat?
>
> Anyone who descends into himself understands *musica humana*. For what is there that could blend the incorporeal life-force of reason with the body save for a kind of harmony (*coaptatio*)[4] and tuning (*temperatio*) of, as it were, low and high tones, as though producing a single consonance? What else could join together the parts of the soul, which, according to Aristotle, is compounded from the rational and the irrational. What else, moreover, could blend together the elements of the body or hold its parts together in a calculated harmony (*rata coaptatio*)?

Boethius seeks to persuade here not by reasoned arguments but by rhetoric: an interrogative, anaphoric tricolon (which, I might add, is pure Boethius and does not breathe the drier air of late-Greek scholasticism that pervades the five books to follow): *quid est . . . ? quid est aliud. . . ? quid uero. . . ?* Boethius clearly supposed that the only answer that could be given to all these questions was the answer obvious to him. This, of course, was not always the case. Most famously, the fourteenth-century music theorist, Johannes de Grocheio, dismissed *musica mundana* and *musica humana* as mere figments of the Pythagorean imagination: *Qui uero sic diuidunt, aut dictum suum fingunt, aut uolunt Pythagoricis uel aliis magis quam ueritati oboedire, aut sunt naturam et logicam ignorantes*.[5] As if in direct response to Boethius, Grocheio posed his own rhetorical question to deny the reality of *musica humana*: *Quis enim audiuit complexionem sonare?*[6] Twelfth-century readers, however, were

[3] *Inst. mus.* 1.2 (188.26–189.5).

[4] Cf. Aug. *Trin.* 4.2.4: Haec enim congruentia (siue conuenientia uel concinentia uel consonantia commodius dicitur quod est unum ad duo), in omni compaginatione uel si melius dicitur coaptatione creaturae ualet plurimum. Hanc enim *coaptationem*, sicut mihi nunc occurrit, dicere uolui quam graeci ἁρμονίαν uocant.

[5] Ernst Rohloff, ed., *Der Musiktraktat des Johannes de Grocheo nach dem Quellen neu herausgegeben mit Übersetzung ins Deutsche und Revisionsbericht*, Media Latinitas musica 3 (Leipzig: Komissionsverlag Gebrüder Reinecke, 1943), 46.35–37. For more on the survival and denial of the traditional Boethian tripartition in the thirteenth and early-fourteenth centuries, see Gilles Rico, "Music in the Arts Faculty of Paris in Thirteenth and Early Fourteenth Centuries" (PhD Thesis, Oxford, 2005).

[6] Rohloff, *Der Musiktraktat des Johannes de Grocheo*, 46.42–43. There were traditions (both before and after the twelfth century) that redefined *musica humana* as music produced by the human voice, i.e., vocal music, e.g., Regino of Prum (on whom see Calvin Bower, "Natural and Artificial Music: The Origins and Development of an Aesthetic Concept," *Musica Disciplina* 25 [1971]: 17–34), and, in the thirteenth century, university scholars such as Radulphus Brito

not so literal minded, and by synthesizing Boethius with Calcidius, Macrobius, and Martianus, they conceived a remarkable variety of solutions to explain and exploit the various modalities of *musica humana*, the second stage of our anagogic ascent from the terrestial *musica instrumentalis* to the celestial *musica mundana*.

4.1 *Quantumque per uocem utilitatis capitur ex musica*

The movements of harmony are akin to the motions of soul: this claim is the essential connective tissue within the first reference to μουσική in Plato's *Timaeus*, namely the commendation of hearing, particularly musical hearing, as a helpmate (σύμμαχος) to the soul (47c4–e2). I quote here the passage in full, first in accord with Burnet's OCT text, followed by Calcidius' Latin translation.

> φωνῆς τε δὴ καὶ ἀκοῆς πέρι πάλιν ὁ αὐτὸς λόγος, ἐπὶ ταὐτὰ τῶν αὐτῶν ἕνεκα παρὰ θεῶν δεδωρῆσθαι. λόγος τε γὰρ ἐπ' αὐτὰ ταῦτα τέτακται, τὴν μεγίστην συμβαλλόμενος εἰς αὐτὰ μοῖραν, ὅσον τ' αὖ μουσικῆς φωνῇ χρήσιμον πρὸς ἀκοὴν ἕνεκα ἁρμονίας ἐστὶ δοθέν. ἡ δὲ ἁρμονία, συγγενεῖς ἔχουσα φορὰς ταῖς ἐν ἡμῖν τῆς ψυχῆς περιόδοις, τῷ μετὰ νοῦ προσχρωμένῳ Μούσιας οὐκ ἐφ' ἡδονὴν ἄλογον καθάπερ νῦν εἶναι δοκεῖ χρήσιμος, ἀλλ' ἐπὶ τὴν γεγονυῖαν ἐν ἡμῖν ἀνάρμοστον ψυχῆς περίοδον εἰς κατακόσμησιν καὶ συμφονίαν ἑαυτῇ σύμμαχος ὑπὸ Μουσῶν δέδοται· καὶ ῥυθμὸς αὖ διὰ τὴν ἄμετρον ἐν ἡμῖν καὶ χαρίτων ἐπιδεᾶ γιγνομένην ἐν τοῖς πλείστοις ἕξιν ἐπίκουρος ἐπὶ ταὐτὰ ὑπὸ τῶν αὐτῶν ἐδόθη.
>
> Eadem uocis quoque et auditus ratio est ad eosdem usus atque ad plenam uitae hominum instructionem datorum, siquidem propterea sermonis est ordinata communicatio, ut praesto forent mutuae uoluntatis indicia; quantumque per uocem utilitatis capitur ex musica, totum hoc constat hominum generi propter harmoniam tributum. Harmonia uero, id est modulatio, utpote intentio modificata, cognatas et uelut consanguineas habens commotiones animae nostrae circuitionibus, prudenter utentibus Musarum munere temperantiaeque causa potius quam oblectationis satis est commoda, quippe quae discrepantes et inconsonantes animae commotiones ad concentum exornationemque concordiae Musis auxiliantibus reuocet. Rhythmus autem datus est ut medela contra inlepidam numerorumque et modorum nesciam gratiaeque expertem in plerisque naturam (44.23–45.8).

Differences are immediately apparent, although some are more cosmetic, others more substantive. For instance, by allowing *datorum* (=δεδωρῆσθαι, 47c4) and *datus* (=ἐδόθη, 47e2) to stand alone without an agent, Calcidius effectively silenced Plato's specification that it was the gods (παρὰ θεῶν;

(Hentschel, *Sinnlichkeit und Vernunft*, 296): Sed musica instrumentalis dicitur illa, quae considerat proportionem sonorum in instrumentis, sicut quantum una corda ex distantia ad aliam potest sonare acutius. Sed musica humana considerat proportionem in voce humana, et istae duae partes musicae sunt possibiles et habentur.

ὑπὸ τῶν αὐτῶν) who bestowed harmony and rhythm,[7] but twelfth-century commentators were quick to supply the assumed (and of course singular) *a deo*.[8] Likewise, Calcidius alters Plato's brief commendation of the spoken word (*communicatio sermonis* = λόγος, 47c6). Where, in Plato's text, speech τὴν μεγίστην συμβαλλόμενος εἰς αὐτὰ μοῖραν ('makes the greatest contribution to the same [reason]'), Calcidius substitutes a more concrete rationale: *ut praesto forent mutuae uoluntatis indicia* ('in order that we might indicate our inclinations to each other'), which has no parallel in the Greek.

At Plato's first mention of μουσική, he does not leave the term (which had extraordinarily large compass) unqualified but incorporates it into the more precise, if still ambiguous, construction: ὅσον τ' αὖ μουσικῆς φωνῇ χρήσιμον πρὸς ἀκοὴν (47c7–d1). Plato's intent here has been the subject of some debate. Some commentators, such as Cornford, have supposed that ἀκοὴν is the complement of χρήσιμον πρὸς and read (against the majority of the manuscripts) φωνῆς for φωνῇ, thus construing the phrase: 'all that part of music that is serviceable with respect to the hearing of sound.'[9] Andrew Barker, however, takes φωνῇ as complement to χρήσιμον and construes πρὸς ἀκοὴν independently, translating: 'so much of μουσική as is adapted to sound in relation to the hearing' and elsewhere, 'that part of music which can be deployed by the voice and directed to the hearing.'[10] Calcidius, however, construes ὅσον not with the partitive genitive, μουσικῆς, (as all modern translators assume) but with χρήσιμον (*quantum utilitatis*), and he streamlines the syntax by suppressing πρὸς ἀκοὴν altogether: *quantumque per uocem utilitatis capitur ex musica*. Calcidius' translation thus focuses squarely on music's *utility*, not just its domain (*per uocem*), anticipating and strengthening the cognate *prudenter utentibus* (=τῷ μετὰ νοῦ προσχρωμένῳ) and *commoda* (=χρήσιμος) at 47d3 and 47d4 respectively.[11]

Calcidius, moreover, thought it necessary to intervene at 47d2 and gloss Plato's invocation of ἁρμονία, a term used only once before, at 36e6–37a1, where Plato noted that soul 'participates in reason and harmony' (λογισμοῦ δὲ μετέχουσα καὶ ἁρμονίας ψυχή). There, Calcidius translated ἁρμονίας

[7] Music as a divine gift is a consistent theme in the Platonic dialogues; cf. the similar language at *Rep*. 411e, as well as the parallels (*Leg*. 653c–654a, 665a, 672d, 796e; *Sym*. 197ab; *Crat*. 404e–406a) noted in Francesco Pelosi, *Plato on Music, Soul and Body*, trans. Sophie Henderson (Cambridge: Cambridge University Press, 2010), 68, n. 1.

[8] E.g., *Guillelmi Glos. sup. Tim.* 152.20–21: EADEM RATIO EST VOCIS ET AVDITVS quae et uisus DATORVM homini a Deo AD EOSDEM VSVS.

[9] Francis MacDonald Cornford, *Plato's Cosmology: The Timaeus of Plato, Translated with a Running Commentary*, International Library of Psychology, Philosophy, and Scientific Method (London: Routledge, 1977), 158. Cornford offers the following justification in a footnote: 'reading φωνῆς χρήσιμον πρὸς ἀκοὴν, φωνῆς being governed by ἀκοὴν. [...] φωνῇ χρήσιμον can hardly mean 'vocal'; and why should instrumental music be excluded? Nor can it mean 'expressed in sound'; and 'useful to the voice' is irrelevant.'

[10] Barker, "Timaeus on Music," 85; Barker, *The Science of Harmonics*, 325.

[11] Cf. Pelosi, *Plato on Music*, 71.

with *modulaminis*: *rationis tamen et item modulaminis compos* (29.7–8). Here, however, at the second occurrence of ἁρμονία, he deploys the loan word, *harmonia*, and offers a translator's gloss: *id est modulatio, utpote intentio modificata*.[12] The linguistic play of *modulatio* and *modificatus*, cognate with *modulamen* at 37d1 and all derived from the concept *modus* ('measure,' 'mode,' and 'melody'), stresses that this *harmonia* is a measured, mathematical, not (merely) phenomenological, concept governed by ratios. The numerical dimension of Plato's argument is further intensified at 47d7. There, Plato describes the disharmony of the soul (the ἀνάρμοστον ψυχῆς περιόδον of 47d5) with the new term ἄμετρον ('without measure'), which Calcidius renders with the hendiadys,[13] *numerorum et modorum nesciam*, thus bringing number from a background assumption to a foreground assertion.

Calcidius' commentary is known neither for its concision nor its clarity, and the commentary on this passage is a case in point. Nevertheless, the complex and intricate nexus of soul, body, virtue, and music in this passage provides a useful (and pre-Boethian) point of departure for a discussion of *musica humana*. Here is Calcidius' commentary on 47c4–e2 in full.[14]

> Transit deinde ad alterius sensus examinationem. Ait enim: Eadem uocis quoque et auditus ratio est ad eosdem usus atque ad plenam uitae hominum instructionem datorum. Sunt igitur principales duo sensus uisus et auditus, utique philosophiam adiuuantes; quorum alter quidem euidentior, utpote qui res ipsas acie sua comprehendat, alter latior, ideo quod

[12] The nominal form of the relatively rare *modificatus* reappears in a similar sense in Martianus Capella's description of Apollo's musical grove (*De nuptiis* 1.11 [7.5–6]): Nec mirum quod Apollinis silva ita rata modificatione congrueret, cum caeli quoque orbes idem Delius moduletur in Sole.

[13] This accords well with Calcidius' general translation strategy, e.g., in this passage alone: συγγενεῖς = *cognatas et uelut consanguineas*; ἀνάρμοστον = *discrepantes et inconsonantes*, etc.

[14] *In Tim.* 268 (272.3–273.6): [Plato] then transitions to an examination of another sense, saying 'the same reason [as given for vision] holds as well for voice and hearing, which have been bestowed for the very same use [as vision], namely the full instruction and shaping of human life.' Hence, there are two principal senses, vision and hearing; each is conducive to philosophy – the former more evidently, insofar as it comprehends things in themselves with the keenness of its glance; the latter more broadly, insofar as it also offers instruction about things absent [to vision], since air, when measured in harmony with an articulate voice and made into a voice and an intelligible enunciation, reaches the inmost senses of the listener and announces to the intellect things that are present as well as absent. That hearing is also a helpmate to the intellect, Plato proves by saying: 'the full extent of the utility deriving from music through voice has clearly been granted to humankind for the sake of harmony.' For earlier Plato had constructed the soul in accord with harmonic ratios and had claimed that its natural actions are comprised of rhythm and measure. But because of the forgetfulness that, of necessity, occurs when the soul is joined to the body, these harmonies fade away; hence, the souls of many are rendered out-of-tune. Plato says that the cure for this ill is held within music – not within the music that delights the common crowd, since such music, created for pleasure, often stirs up more faults, but within the divine music that can never be separated from reason [*ratio*] and intelligence. For Plato is of the opinion that this music can, at long last, recall souls that are wandering astray from the right path to their former harmony. Moreover, the greatest consonance [*symphonia*] of our character is justice, the chief of all virtues; through it, all the others acquire their right goal and end, provided that reason take its place as leader and that inner vigor, similar to irascibility, willingly offer itself as an aid to reason. Furthermore, none of this can occur without harmonious measuring [*modulatio*], but there can be no harmonious measuring without a consonance [*symphonia*], and consonance is a consequence of music. Without a doubt, then, music rationally adorns the soul; it recalls it to its pristine nature and renders it such as it was when god the creator had made it in the very beginning. But music is entirely comprised of voice, hearing, and sound. Whence, this sense too is useful for the pursuit of all philosophy, for the understanding of intelligible reality.

> etiam de rebus absentibus instruat, modulatus siquidem aer articulatae uoci factusque uox et intellegibilis oratio pergit ad intimos sensus audientis intellectui nuntians tam praesentia quam absentia. Idem auditus quod intellectum quoque adiuuet, sic probat: quantumque per uocem utilitatis capitur ex musica, totum hoc constat hominum generi propter harmoniam tributum, quia iuxta rationem harmonicam animam in superioribus aedificauerat naturalemque eius actum rhythmis modisque constare dixerat, sed haec exolescere animae ob consortium corporis necessario obtinente obliuione proptereaque immodulatas fore animas plurimorum. Medelam huius uitii dicit esse in musica postiam, non in ea qua uulgus delectatur quaeque ad uoluptatem facta excitat uitia non numquam, sed in illa diuina, quae numquam a ratione atque intellegentia separetur; hanc enim censet exorbitantes animas a uia recta reuocare demum ad symphoniam ueterem. Optima porro symphonia est in moribus nostris iustitia, uirtutum omnium principalis, per quam ceterae quoque uirtutes suum munus atque opus exequuntur, ut ratio quidem dux sit, uigor uero intimus, qui est iracundiae similis, auxiliatorem se rationi uolens praebeat; porro haec prouenire sine modulatione non possunt, modulatio demum sine symphonia nulla sit, ipsa symphonia sequitur musica. Procul dubio musica exornat animam rationabiliter ad antiquam naturam reuocans et efficiens talem demum qualem initio deus opifex eam fecerat. Tota porro musica in uoce et auditu et sonis posita est. Utilis ergo etiam iste sensus est philosophiae totius assecutioni ad notationem intellegibilis rei.

As is often the case, Calcidius' explanation says simultaneously more and less than the dense passage upon which it comments. The essential claim highlighted above – that *harmonia* has movements cognate to the revolutions of soul within us – is passed over in silence. Calcidius says nothing explicit or concrete about the affinity or similarity between music and soul, but only vaguely directs us to earlier passages (*in superioribus*), presumably to the construction of the human soul at 41d and its mathematical structure analogous to the world soul at 35bff.[15] On the more difficult question of what Plato precisely means by ἁρμονία in this passage, Calcidius again says nothing (save for the gloss in his translation, discussed above). Instead, he chooses to focus on the therapeutic utility of music – its ability, through a kind of soul therapy, to restore the soul to its former harmony.[16] Plato gives us

[15] In a chapter on the ontology of the soul (*In Tim.* 228 [243.13–244.10]), Calcidius tries to defend Plato against commentators who accuse him of inconsistency, as the *Phaedrus* proposes a simple soul but the *Timaeus* a seemingly composite soul: hoc loco calumniari solent homines quibus ueri indagandi cura nulla est. Dicunt enim Platonem in Phaedro quidem asserere animam esse sine ulla compositione proptereaque indissolubilem (cfr. *Phaedrus* 245c5–246a2, translated by Calcidius at 82–83, [104.18–105.18]), in Timaeo tamen compositam rem confiteri, siquidem faciat eam constare ex indiuidua diuiduaque substantia et ita diuersa eademque natura. Against those impugning Plato's self-contradiction, Calcidius replies that the Timaean composite soul is not actually composite but has a *ratio compositionis*, a system or ratio of composition, as in a musical concord like the diatessaron: quiddam uero, quod compositum quidem non sit, habeat tamen rationem compositionis, ut in musica symphonia, quae diatessaron uocatur.

[16] Music as a form of soul therapy or, conversely, moral character as a kind of musical modality is manifest in Plato's early ethical dialogues as well: cf. *Laches* 188d, 193de. It is worth observing the repeated mention of Damon (180d, 197d, 200ab; cf. *Rep.* 400b2), who is introduced in the *Laches* as a music teacher (διδάσκαλος μουσικῆς, 180d). The connection between Damon and the training of character through music is attested also in fragment B7 (= Aristides Quintilianus, *De Musica*, 2.14). On this fragment, and on music as soul therapy in general, see Frédérique Woerther, "Music and the Education of the Soul in Plato and Aristotle: Homeopathy and the Formation of Character," *Classical Quarterly* 58 (2008): 89–103; Pelosi, *Plato on Music*, 29–67.

no account here for the disharmony of the soul such that it would require music's restorative powers; we are only (at 47d5) that music is an ally (*σύμμαχος*) in the re-harmonization of the disharmonious revolution of soul within us (*ἐπὶ τὴν γεγονυῖαν ἐν ἡμῖν ἀνάρμαστον ψυχῆς περίοδον*). Calcidius, however, explicitly names the source of this disharmony. The culprit is the body, through conjunction with which the soul is necessarily cast into a state of oblivion. Famously, Calcidius has no account of the (Neoplatonic) descent of the soul, such as we find in Macrobius' *Commentarii in Somnium Scipionis* 1.12;[17] nonetheless, Calcidius' language here (*exolescere*, *obtinente obliuione*) obliquely recalls *Phaedrus* 248c and anticipates, if only faintly, Macrobius.[18] Hence, through the corporeal contagion of union with the body, the soul forgets its former harmony and becomes an out-of-tune, pale echo of the *antiqua harmonia* that obtained at the moment of its creation.

At the same time, however, *musica* – that is to say *diuina musica* and not the *musica uulgorum* – is presented as a cure, a means of restoring the soul to its pristine harmony. Calcidius' specification of the proper soul therapy as *diuina musica, quae numquam a ratione atque intellegentia separetur*, recalls the account of musical harmony at *Tim.* 80ab. There Plato observes that the proper blending of low and high tones (arising, respectively, from slower and faster motions)[19] produces a single sensation (*μίαν ἐξ ὀξείας καὶ βαρείας συνεκεράσαντο πάθην*, 80b4–5) that is a source of (bodily) pleasure (*ἡδονή*) to the unintelligent but a source of (intellectual) delight (*εὐφροσύνη*) to the intelligent,[20] insofar as they recognize in it 'an imitation of *divine harmony*' (*τὴν τῆς θείας ἁρμονίας μίμησιν*, 80b6–7). The all-important participation of the intellect, present in both 80b and 47d, is further stressed by Calcidius: only divine music, never divorced from reason and intellect, can go beyond mere irrational, bodily pleasure (the *ἡδονὴν ἄλογον* of 47d4) to provide a psychological cure. Insofar as the *diuina harmonia* is manifest through mortal motions (*ἐν θνηταῖς [...] φοραῖς*, 80b7), the musical cure is

[17] There is, correspondingly, no hint in Calcidius of Porphyry's *De regressu animae* or *De antro nympharum* such as we find in Macrobius, on which see Courcelle, *Late Latin Writers*, 26–47 and M.A. Elferink, *La descente de l'âme d'après Macrobe*, Philosophia antiqua 16 (Leiden: E.J. Brill, 1968), 3-4 et 7 (cum notis).

[18] Cf. *In Som. Scip.* 1.12.7–8 (49.6–16): anima ergo cum trahitur ad corpus, in hac prima sui productione siluestrem tumultum id est *ὕλην* influentem sibi incipit experiri [...] unde et comes ebrietatis *obliuio* illic animis incipit iam latenter obrepere. There is, however, no hint in Calcidius of the soul's 'intoxication' as in the *Phaedrus* and Macrobius.

[19] On which, see above 3.3 (p. 99).

[20] Cf. *Prot.* 337c1–4, which presents an identical contrast between *εὐφραίνεσθαι*, to feel intellectual delight through intellectual activity alone (*αὐτῇ τῇ διανοίᾳ*), and *ἥδεσθαι*, to feel bodily pleasure through the body alone (*αὐτῷ τῷ σώματι*): *εὐφραίνεσθαι μὲν γὰρ ἔστι μανθάνοντά τι καὶ φρονήσεως μεταλαμβάνοντα αὐτῇ τῇ διανοίᾳ, ἥδεσθαι δὲ ἐσθίοντά τι ἢ ἄλλο ἡδὺ πάσχοντα αὐτῷ τῷ σώματι – pace* Pelosi, *Plato on Music*, 97, who notes the parallel but opines that 'it is highly improbable that one can read the contrast to be found at *Tim.* 80b5–8 in analogous terms. In particular, not only is it difficult to understand the *ἡδονή* in *Tim.* 80b5 as a pleasure of the body, but there is also doubt that it is a pleasure that can be traced to the sphere of sensibility, i.e., of the senses and the mortal soul.'

only effective provided the soul is united to a body, to that 'mighty river' of *αἴσθησις* (43bc), which *eo ipso* allows music to work through the body upon the soul. The body, then, is simultaneously the destroyer and restorer of harmony: it is the (source of the) illness; it is the (conduit for the) cure.

The final theme developed in Calcidius' comments on *Tim.* 47ce, a theme that cements music's utility to the pursuit of philosophy and the understanding of intelligible reality, is the harmony of the virtues, justice in particular. *Iustitia* is not only the chief of the virtues, but it is also the *optima symphonia*, the 'best consonance,' a phrase that obliquely suggests the octave, which, according to many Greek harmonic theorists was the chief of the consonances and the closest to equality.[21] Calcidius locates the harmony of justice within the proper relationship between the ruling power of *ratio* and the ruled *intimus uigor*.[22] Calcidius' levels of division within the soul change (depending on the needs of any given passage),[23] and elsewhere a similar bipartition is divided between the *deliberatiua uis* and the more periphrastic *altera quae ad appetendum quid impellit*.[24] Although Calcidius seems generally to favour the late Platonic bipartition,[25] he does assign the traditional *iracundia* (*θύμος*) and *cupiditas* (*ἐπιθυμία*) as the parts of the appetitive aspect of the soul.[26] The soul's *intimus uigor*, then, is the soul's irrational aspect, although for Calcidius this part (or parts) still participates in rationality.[27] When *ratio* is the *dux* and the (rationally irrational) *intimus uigor* is willingly reason's servant, then

[21] It's worth recalling that Plato, at *Rep.* 430e3–4, relates temperance to a *συμφωνίᾳ τινὶ καὶ ἁρμονίᾳ προσέοικεν μᾶλλον ἢ τὰ πρότερον*. Proclus, in his commentary on the *Republic*, identifies this *συμφωνία* with the octave (*In Remp.* I 213.28–29: *ταῦτα μὲν οὖν παραξέβημεν ἐνδεικνύμενοι, πῶς ἁρμονίαν διὰ πασῶν ὁ Σωκράτης εἶπεν τὴν σωφροσύνην*). On Proclus' discussion see O'Meara, "The Music of Philosophy in Late Antiquity," 143–144 and the note by Winnington-Ingram on *In Remp.* I 212.26ff. in André-Jean Festugière, trans., *Proclus. Commentaire sur le République*, 3 vols., Bibliothèque des textes philosophiques (Paris: J. Vrin, 1970), II.194–195. Cf. Aristotle, *Top.* 4.123a33–37, who observes that such a usage of *συμφωνία* is strictly metaphorical (*οὐ κυρίως ἀλλὰ μεταφορᾷ· πᾶσα γὰρ συμφωνία ἐν φθόγγοις*). On the octave as the first and best consonance, see the Ps.-Aristotelian *Problemata* 19.35 and 39; Ptolemy, *Harm.* 1.5 (11.22ff.), 1.7 (15.2ff); Aristides Quintilianus, *De musica* 2.12 (77.16ff); Boethius, *Inst. mus.* 2.18 (249.22–29), 2.20 (251.16–20) (cf. supra 3.2 [p. 92]).

[22] Cf. *Rep.* 441e4-6: *οὐκοῦν τῷ μὲν λογιστικῷ ἄρχειν προσήκει, σοφῷ ὄντι καὶ ἔχοντι τὴν ὑπὲρ ἁπάσης τῆς ψυχῆς προμήθειαν, τῷ δὲ θυμοειδεῖ ὑπηκόῳ εἶναι καὶ συμμάχῳ τούτου;* On this passage and Plato's psychology of justice in general, see John M. Cooper, "The Psychology of Justice in Plato," *American Philosophical Quarterly* 14 (1977): 151–157.

[23] For a brief synopsis of Calcidius' division(s) of the soul, see Stephen Gersh, *Middle Platonism and Neoplatonism: The Latin Tradition*, Publications in Medieval Studies 2 (Notre Dame, Ind.: University of Notre Dame Press, 1986), 486–488.

[24] *In Tim.* 230 (244.21–245.1): Quia igitur principales uires animae duae sunt, una deliberatiua, altera quae ad appetendum quid impellit, et est deliberatiua quidem uirtus propria rationabilis animantis, illa uero alia id ipsum animantis.

[25] See D.A. Rees, "Bipartition of the Soul in the Early Academy," *The Journal of Hellenic Studies* 77 (1957): 112–118; Dillon, *Alcinous. The Handbook of Platonism*, 149–150.

[26] *In Tim.* 225 (241.2–5): Proptereaque diuiditur primitus in duas species, rationabilem et eam ex qua sunt appetitus, deinde subdiuiditur in opinionem intellectumque et demum in iracundiam et cupiditatem. Cf. *In Tim.* 201 (221.2–3): appetitum, qui diuiditur in iracundiam et cupiditatem.

[27] *In Tim.* 182 (209.20–22): cupiditas porro atque iracundia uel agrestium uel mansuetorum appetitus inrationabilis est, hominis uero, cuius est proprium rationi mentem applicare, rationabilis.

justice, as the *symphonia* between *dux* and *seruus*, obtains within the soul.[28] Calcidius, at last, brings his argument to a close by drawing an inferential chain that links the harmony of justice and the virtues in general to the 'reality' of music: justice supposes *modulatio*; *modulatio* supposes *symphonia*; and *symphonia* supposes *musica*. Thus runs the sequential chain from virtue to music and back again from *auditus* to *res intelligibilis*.

4.2 The ethical utility of music in the twelfth century

For both Bernard of Chartres and William of Conches, Plato's *Timaeus* (more accurately, the Calcidian *Timaeus*) was a deeply moral text; it was a handbook in macrocosmic ethics, the *iustitia naturalis*, which arises from the rational order of the cosmos and in turn is reflected on a microcosmic scale in the *iustitia positiua*, the laws, customs, and ethics of human society.[29] Accordingly, both these Timaean commentators interpreted the gifts of sight and hearing (*Tim.* 47a–e) in a moral light, and Calcidius' *utilitas* becomes an almost exclusively moral utility. Both sight and hearing are essential for human morality and proper conduct: sight, so that we can see and imitate the harmony that the universe maintains between the heavens' motions, one rational (the fixed stars), the other irrational (the planets);[30] hearing, so that we can compose within our morals and conduct the same sort of harmony that we hear between pitches in proper proportion.

[28] It is possible that Calcidius here is reliant on an intermediary, as a similar but more developed theory of virtues as consonances reemerges in the thought of Iamblichus, Proclus, and Damascius. They too associated the virtues with the perfection of number and harmony, and Proclus in particular seems to have associated temperance and justice with the octave, the latter described in similar terms as the harmony of ruler to ruled; e.g., Damascius, *In Phaedonem* II.55 (reporting the teaching of Proclus): 'Justice is discriminating concord, whereas moderation is integrating concord; justice seeks its own in such a way as to keep each thing distinct, yet common to all. Moderation, then, is concord between the controlling and the controlled, justice between the rulers and the ruled' (quoted and translated in O'Meara, "The Music of Philosophy in Late Antiquity," 144). For a fuller discussion of ethical arithmetic and harmonics, see ibid., 143–145; O'Meara, *Pythagoras Revived: Mathematics and Philosophy in Late Antiquity*, 70–76; and A.A. Long, "The Harmonics of Stoic Virtue," in *Stoic Studies* (Berkeley: University of California Press, 2001), 202–223.

[29] *Bernardi Glos. sup. Tim.* 1.11–14, 20–22, 32–36; *Guillelmi Glos. sup. Tim.* 3.1–14; for a transcription and discussion of other examples of the political mirror of the cosmos in Timaean *accessus*, see Tullio Gregory, *Platonismo medievale. Studi e ricerche*, Studi storici, Fasc. 26–27 (Rome: Istituto storico italiano per il medio evo, 1958), 59–73; for a detailed study of one aspect of this tradition, see Paul Edward Dutton, "*Illustre ciuitatis et populi exemplum*: Plato's *Timaeus* and the Transmission from Calcidius to the End of the Twelfth Century of a Tripartite Scheme of Society," *Mediaeval Studies* 45 (1983): 79–119.

[30] *Bernardi Glos. sup. Tim.* 7.389–394: Ad quae uisus est necessarius, quia per uisum notamus rationabilem motum aplanos, qui et se ipsum mouet sine errore et planetarum erraticos motus contemperat. Quod notantes debemus aplanon nostrae mentis ita instituere, ut se ipsum sine errore moueat et erroneos motus uitiorum refrenet, quae morum correctio ualet in publicis et priuatis rebus. *Guillelmi Glos. sup. Tim.* 151.19–23: Dedit ergo Deus oculos homini ut, cum perciperet homo duos esse motus in caelestibus et similies in se, quemadmodum diuina ratio facit erraticum motum sequi rationabilem motum firmamenti ita erraticos motus carnis subdere rationabli motui spiritus.

Bernard observes that there are three kinds of *uoces* that have utility in their hearing: *intellectae*, *modulatae*, and *numeratae*, corresponding to the spoken word, heard music, and metrical prosody respectively.[31] An extended gloss exclusive to a Vatican manuscript of William's *Glosae super Platonem* (Urbinas latinus 1389), which may well be an *echte* Conchenian gloss, connects the *uoces* of *Tim*. 47ce to (an adaptation of) the Ptolemaic division of *uoces armoniae aptae* at *De institutione musica*, 5.6. The spoken *uox* is a *uox continua* and thus *exmelica* (sc. ἐκμελής); the musical *uox* is a *uox discreta* and thus *emelica* (sc. ἐμμελής).[32] According to both commentators, it is the musical and rhythmical *uoces* that prove their moral worth. Thus, for Bernard of Chartres, the greatest utility of *musica exterior* is to our moral compass:[33]

> Docet quomodo auditus ualeat ad philosophiam: quia ualet ad correctionem morum. Auditis [*scripsi*, auditus *Dutton*] enim consonantiis musicis, debemus in moribus nostris uirtutum consonantia reformari. Licet enim anima secundum consonantias sit compacta, tamen ipsae consonantiae ex corporum coniunctione dissonae fiunt et reformandae sunt per exteriorem musicam. Et hoc est: tota musica data est hominibus non ad delectationem, sed ad morum compositionem.[34]

So too, for William of Conches, the utility of melody consists in its ability to 'shape within one's morals the same sort of concord one perceives in sounds.'[35] Both, moreover, explicitly externalize the musical cure and understand Calcidius' gloss on *harmonia* as a signpost for sounding music. For

[31] *Bernardi Glos. sup. Tim.* 7.452–458: Nota uoces per auditum prodesse nobis tribus modis: Intellectae, id est sola significatione, nobis prosunt ad mutuam uoluntantem intimandam. Modulatae etiam absque significatione prosunt ad concentum, scilicet morum, qui in cantu notatur. Numeratae quoque prosunt ad parilitatem et conuenientiam, quae alteri ab altero exhibenda est, quod in rithmo consideratur. Rithmus enim interpretatur numerus.

[32] *Guillelmi Glos. sup. Tim.* 153.6 cum apparatu critico: Ita habemus quod uox alia est continua ut usualis sermo, quod dicitur 'exmelica' [*scripsi*, ex melica *cod.*], id est extra melodiam, alia est discreta que uocatur e[t]melica [*scripsi*, et melica *cod.*], id est cum melodia, ut est musica que consitit in elleuatione et depressione. Sed dictum de continua. Modo dicit de discreta, scilicet de musica. Sed de musica quedam est melica, id est cum melodiis ut instrumentis et cantilenis; quedam est rithmica, que constitit in equali numero; similiter quedam est metrica ut in numero pedum. Sed prius ostendit utilitatem melice musice, uocans eam armoniam, id est modulatam quia ex intensione cordarum habet fieri. Postea aget de duabus aliis simul, ostendens scilicet quod sicut ibi obseruatur numerus et modus, ita natura hominis reducatur ad modum, ad numerus, ita scilicet quod nichil extra modum uel numerum faciat [*scripsi*, fatiat *cod.*]. Cf. *Inst. mus.* 5.6 (356.26–357.11) et *Guillelmi Glos. sup. Tim.* 152.23–25: Ostensurus quae utilitas sit in uoce, prius hoc ostendit circa *uocem continuam*, id est sine modulatione, quae dicitur sermo communis.

[33] *Bernardi Glos. sup. Tim.* 7.437–443: [Plato] teaches how hearing is of value to philosophy: because it has value for the correction of morals. For when we hear musical consonances, we should be reformed in our morals by the consonance of the virtues. For although the soul is joined together according to the musical consonances, nevertheless, those consonances are knocked out of tune [*dissonae fiunt*] by its conjunction with the body, and so ought to be reformed through external music. And this is what Plato means when he says, 'All music was given to men not for the sake of pleasure, but for the composition of their morals.

[34] Cf. *Bernardi Glos. sup. Tim.* 3.64–68: ita nutriendi sunt tutores patriae, ut prompti ad laborem et affabiles sint obedientibus. Quod prompti sint per exercitium, scilicet cursum, uenatum, et ludos gymnasii; quod mites et affabiles, per delinimenta praeparatur musicae, quae per sonorum conuenientiam morum docet concordiam.

[35] *Guillelmi Glos. sup. Tim.* 153.1–4: Ostenso quae utilitas sit in communi sermone, ostendit quae utilitas sit in melodiis, haec scilicet ut qualem concordiam in sonis homo perciperet, eandem in moribus conformaret.

Bernard, the *intensio modificata* obtains 'either between two strings, or between weights, or between voices' (*uel inter duas cordas, uel inter pondera, uel inter uoces*).[36] William breaks the two terms into two separate but related glosses: *intensio* indicates that one voice or pitch is higher than another, but since dissonant pitches are not yet excluded by such a definition, *modificata* makes the necessary specification, that is, an *intensio* made according to measure or proportion, for consonance is the concordant diversity of sounds.[37] Nonetheless, there is one significant difference between Bernard and William. Bernard, as he often does, silently follows Calcidius' commentary and thereby identifies the body as the root cause of the soul's disharmony.[38] For William, however, the disharmony is explained entirely on moral grounds, and the body is not brought into play: the *discrepantes et inconsonantes commotiones animae* are *ira, turbulentia et huiusmodi*.[39] This will be important for William's explanation for the union of body and soul, which (as we will see) requires the body to have a harmony of its own, and thus it can hardly be the agent of the soul's disharmony. Finally, in line with Calcidius' translation, both understand rhythm as a numerical principle[40] with a similarly moral utility.[41]

Bernard's *consonantia uirtutum* and William's *concordia in moribus* are not unique in the twelfth century; to the contrary, the *topos* of music's ethical domain and dominion approaches ubiquity. Adelard of Bath, noting music's great power over souls (*Adeo hec vis anime imperativa est!*), remarks that in the wisdom of old age a listener is not only delighted by harmonious voices (*uocum concordiam*), but he strives to bring his character and all his deeds into ethical consonance (*ethicam consonantiam*).[42] In Honorius of Autun's *De animae exilio et patria*, travelers are cast into interior

[36] *Bernardi Glos. sup. Tim.* 7.444–445.

[37] *Guillelmi Glos. sup. Tim.* 153.7–11: Et quid est armonia? ARMONIA VERO ID EST MODVLATIO. Et quare modulatio? VTPOTE id est sicut INTENSIO, quia una uox est altior altera. Sed quia hoc totum habet dissonantia, addit: MODIFICATA, id est in modo et proportione facta – est enim consonantia diuersitas sonorum concors. Cf. Bernard Silvestris, *Comm. in Mart.* 8.330–331183: RATA MODIFICATIONE, certa proportione, que dicitur modificatio, quia facit modos, scilicet simphonias.

[38] *Bernardi Glos. sup. Tim.* 7.439–441: Licet enim anima secundum consonantias sit compacta, tamen ipsae consonantiae ex corporum coniunctione dissonae fiunt.

[39] *Guillelmi Glos. sup. Tim.* 153.18–19.

[40] Cf. Isidore, *Etym.* 1.39.3: rythmus [. . .] qui latine nihil aliud quam numerus dicitur.

[41] *Bernardi Glos. sup. Tim.* 7.449–452: RITHMVS. Aliud genus auditus datum ad aures mulcendas ponit, quasi non solum musicae consonantiae ualent ad morum compositionem, sed etiam rithmus. Rithmus est aequalis numerus sillabarum et, secundum eius aequalitatem, statuenda est aequalitas in moribus nostris. *Guillelmi Glos. sup. Tim.* 153.21–31: RITHMVS AVTEM DATVS EST a Deo homini QVASI MEDELA non contra corporeos morbos sed CONTRA NATVRAM id est inseparabilem animi qualitatem ILLEPIDAM id est insuauem ET NESCIAM NVMERORVM ET MODORVM, id est quae sine modo et mensura agit quidquid agit. Contra hanc est rithmus datus homini ut, cum audiret uersus illos placere quia sunt in numero et modo, quidquid ageret ad numerum et modum reduceret ut et Deo et homini placeret.

[42] *De eodem et diuerso* 52: In senectute vero tantam hoc decus effiatiam obtinet ut non solum vocum concordiam hec

exile on account of their ignorance and thus journey through ten cities (the liberal arts, physics, mechanics, and economics) in their return to wisdom. As they pass through the fifth city, the *ciuitas musica*, they are taught that they must pass *per modulamen morum* on their way to the *concentum caelorum*.[43] In Alan de Lille's *De planctu naturae*, Natura mixes musical and grammatical metaphors to lament that, within her dominion, man alone has scorned the 'cithara of my moderation and is deluded by the lyre of a delirious Orpheus. For the human race, degenerating from its genteel origins, commits barbarisms in its construction of genders and by inverting the rules of Venus employs a most irregular metaplasm.'[44] It can be no mere coincidence, then, that in Alan's *Anticlaudianus*, it is Discord and her minions, the avowed enemies of Concord, that mount the Vices' first charge against the Virtues in the elaborate *psychomachia* at the poem's end.[45] And Bernard Silvestris, in the commentary on Martianus, echoes Macrobius' Vergilian praise of music – *dat musica so⟨m⟩nos et adimit, iram suggerit, clementiam suadet*[46] – as a stage in his proof that music is innate within every ensouled being.[47] Finally, the compiler of the *Moralium dogma philosophorum*, a twelfth-century ethical florilegium sometimes ascribed to William of Conches,[48] saw fit to bring the text to a conclusion with an extended musical analogy based on a passage from Cicero:[49]

etas exposcat, verum et mores et facta universa in ethicam consonantiam redigere et gaudeat et nitatur. Unde et, hac intentione firmiter constituta, a quampluribus sapientibus hec etas 'gravis' appellatur.

[43] PL 172, 1244C: In hac urbe docentur viantes per modulamen morum transire ad concentum coelorum.

[44] *De planctu naturae* VIII.2: Solus homo, mee moderationis citharam aspernatus, sub delirantis Orphei lira delirat: humanum namque genus a sua generositate degenerans, in constructione generum barbarizans, venereas regulas invertendo, nimis irregulari utitur metaplasmo.

[45] *Anticlaudianus* 8.221–223: prima sitit bellum Discordia, prima tumultus / appetit et primi preludia Martis inire / preparat [. . .]. Ibid., 9.9–10: prima viro movet assultus Discordia, primum / aggreditur Martem, primo casura tumultu.

[46] *Comm. in Mart.* 3.145–146; Macrobius, *In Som. Scip.* 2.3.9 (105.22–24): dat somnos adimitque, nec non curas et immittit et retrahit, iram suggerit, clementiam suadet, corporum quoque morbis medetur, nam hinc est quod aegris remedia praestantes praecinere dicuntur. Verg. *Aeneid*. 4.244: dat somnos adimitque [. . .].

[47] *Comm. in Mart.* 3.150–153: Que res indicium est musicam animantibus innatam, dum ea que nullum deliberationis arbitrium habent, vocum modulamina solo nature ductu vel proferunt vel proferentibus congaudent.

[48] For a review of the early scholarship, see John R. Williams, "The Quest for the Author of the *Moralium dogma philosophorum*, 1931–1956," *Speculum* 32 (1957): 736–747.

[49] Just as in strings or flutes, even if they are only slightly out of tune, this is nevertheless usually detected by their creator, so too ought we to lead our life, lest anything happen to be out of tune, or rather we should do so all the more, insofar as a harmony of actions is greater than a harmony of sounds. Thus, just as the ears of musicians perceive the slightest variation in strings, so too we, if we want to be keen observers of moral flaws, will often understand things of great importance in the smallest of matters: from a glance of the eyes or a raising or furrowing of the brows, from sorrow, joyfulness, laughter, or speech, from a high or low tone of a voice, or the like, we will easily judge what would be right to do, or what would be out of tune with our purpose. Cf. Cicero, *De officiis* 1.146. It is worth observing, however, that in the *Moralium* the virtue of *Concordia* is presented as a subspecies of justice and thus as a public, political virtue, not a private, moral one: Concordia est uirtus conciues et compatriotas in eodem iure et cohabitacione spontanee uinciens (*Moralium* I.B.2.bII.ζ). This too concords with Cicero, *De officiis* 2.20.78, where *concordia* (alongside *aequitas*) is deemed one of the *fundamenta rei publicae*. In Alan de Lille's *Anticlaudianus*, Concordia, the first of Nature's sisters and counselors, is likewise first described in civic terms; her garment (described at 2.178–199) depicts famed biblical and classical friendships (David and Jonathan, Theseus and Pirithous, Tydeus and Polynices, Nisus and Euryalus, etc.) and

> Vt enim in fidibus aut tibiis quamuis paulum discrepent, tamen id ab artifice animaduerti solet, sic nobis ducenda est uita, ne forte quid discrepet, uel etiam multo magis in quantum melior est actionum quam sonorum concentus. Itaque ut in fidibus musicorum aures uel minima sentiunt, sic nos, si uolumus esse acres uitiorum animaduersores, magna sepe intelligemus ex paruis: ex occulorum obtutu, ex remissis aut contractis superciliis, ex mesticia, ex hilaritate, ex risu, ex locutione, ex contentione uocis, ex summissione, ex ceteris similibus facile iudicabimus, quid eorum apte fiat quidue ab officio discrepet.

The *locus classicus* for these and the many other invocations of a 'musical ethics' is Boethius' *De institutione musica*, whose prooemium stands as an elegant encomium of music's great force: the arcane Lacedaemonian decree; the mythic tales of Pythagoras and Empedocles calming many a frenzied youth; the wondrous healing power of melody over bodily ills – all attest to the unique sway that music has over both soul and body. Hence Boethius' most famous claim: *Unde fit ut, cum sint quattuor matheseos disciplinae, ceterae quidem in investigatione veritatis laborent, musica vero non modo speculationi uerum etiam moralitati coniuncta sit.*[50] The prooemium, then, is more than an encomium; it is also a powerful argument for the reality of the harmonic composition of both body and soul, for the many mythic, even anecdotal examples of music's affective power (both therapeutic and corruptive) are wrapped in arguments that frame this musical ethics in terms of *musica humana*. Near the beginning of the prooemium, immediately following an approving glance at the *Timaeus* and the harmonious construction of the *anima mundi*,[51] Entirely in line with *Tim.* 47d2, Boethius suggests that the harmonies in sound (*quod in sonis apte convenienterque coniunctum est*) are akin to the harmonies in us (*quod in nobis est iunctum convenienterque coaptatum*). When we hear melodies and are delighted by them, we can recognize that we too are composed in the same likeness.[52] Thus, with it established as a basic principle that *amica est enim similitudo, dissimilitudo odiosa atque contraria* (180.9–10), Boethius launches into his many examples, finally circling back again at the end of the prooemium to remind us what his various stories prove *in toto*:[53]

she is introduced as holding in her right hand an olive branch (2.205–207: virginis in dextra, foliorum crine comatus, / flore tumens, fructus expectans, ramus olive / pubescit); finally, her initial words lament provocations of civil strife, including those of Crassus, Pompey, Caesar, and Anthony (2.213–241)). At this point, the description of Concordia turns from political concord to cosmological concord.

[50] *Inst. mus.* 1.1 (179.20–23).

[51] *Inst. mus.* 1.1 (180.3–5): Hinc etiam internosci potest, quod non frustra a Platone dictum sit, mundi animam musica convenientia fuisse coniunctam.

[52] *Inst. mus.* 1.1 (180.5–9): Cum enim eo, quod in nobis est iunctum convenienterque coaptatum, illud excipimus, quod in sonis apte convenienterque coniunctum est, eoque delectamur, nos quoque ipsos eadem similitudine compactos esse cognoscimus.

[53] *Inst. mus.* 1.1 (186.8–187.10): But to what purpose are all these? So that there can be no doubt that the state of our soul and body seems to be composed, somehow, by the very same proportions that, as subsequent demonstrations will prove, join and unite melodic constructions of pitches. [. . .] But what of the fact that when someone listens to a song

> Sed quorsum istaec? Quia non potest dubitari, quin nostrae animae et corporis status eisdem quodammodo proportionibus videatur esse compositus, quibus armonicas modulationes posterior disputatio coniungi copularique monstrabit. [...] Quid? quod, cum aliquis cantilenam libentius auribus atque animo capit, ad illud etiam non sponte convertitur, ut motum quoque aliquem similem auditae cantilenae corpus effingat; et quod omnino aliquod melos auditum sibi memor animus ipse decerpat? ut ex his omnibus perspicue nec dubitanter appareat, ita nobis musicam naturaliter esse coniunctam, ut ea ne si velimus quidem carere possimus.

Music's soul-therapy is thus a kind of homeopathy – the ancient maxim, *τὸ ὅμοιον τῷ ὁμοίῳ*, recast as *similia similibus curantur* (to invoke the famed catchphrase of the nineteenth-century physician, Samuel Hahnemann). What, then, is the connection between *anima* and *harmonia*? We begin with the most ancient, the most celebrated, and certainly the most debated of arguments for a connection between music and soul, and this in order to draw a careful distinction between two views often conflated: that soul *is* harmony and that soul *has* harmony.

4.3 Soul: being harmony, having harmony

At the earliest appearance of the argument that soul is harmony – more precisely, a harmony resulting from a particular arrangement of bodily elements (hereafter the Harmony Thesis) – it is emphatically denied:[54] *οὐκ ἄρα, ὦ ἄριστε, ἡμῖν οὐδαμῇ καλῶς ἔχει ψυχὴν ἁρμονίαν τινὰ φάναι εἶναι* ('in no way at all then, my friend, do we approve of the thesis that soul is a kind of harmony'). In these words, Socrates dismisses the view first articulated by Simmias in Plato's *Phaedo* (94e8–95a1). The Harmony Thesis, however, was doomed from the start by the very dialectical structure of Plato's larger argument: it is proposed not as a positive thesis but as a potent challenge to the immortality of the soul. Hence, Plato was obliged to refute it.[55] Simmias proposes the Harmony Thesis as a counterargument to Socrates' affinity argument for the soul's immortality. Socrates had concluded (78b–80a) that since the soul's being is closer to the sort of being possessed by the Forms (the Equal, the Beautiful, and the like) than it is to the homonymous being (*πάντων τῶν ἐκείνοις ὁμωνύμων*) possessed by individual

willingly with ears and mind, he is also involuntarily turned toward it such that his body makes a kind of motion similar to the song he is listening to? And what of the fact the mind itself can pick out entirely by memory some melody that it has heard? So that from all of these it might be unfailingly clear that music is so naturally united with us that we cannot be without it, even if we so desired.

[54] For a general history and overview of the Harmony Thesis in its various guises, see H. B. Gottschalk, "Soul as Harmonia," *Phronesis* 16 (1971): 179–98.

[55] On the strength of the Harmony Thesis as a challenge to the affinity argument, see Ellen Wagner, "Supervenience and the Thesis that the Soul Is a *Harmonia*," in *Essays on Plato's Psychology*, ed. Ellen Wagner (Lanham: Lexington Books, 2001), 69–88.

instantiations of the Forms (equal sticks and stones, beautiful men or horses, etc.), we could expect that the soul shares with the Forms the property of immortality. In response, Simmias offers an affinity argument of his own: since 'the harmony of a lyre and its strings is something invisible and incorporeal and very lovely and divine in the harmonized lyre, while the lyre itself and its strings are corporeal bodies and composite and earthy and akin to the mortal' (85e3–86a3), then perhaps in an analogous manner 'our body is kept in tension, as it were, and held together by hot and cold, dry and wet, and the like, and our soul is a blending and harmony of these same things, when they are blended with each other in due proportion' (86b7–c1). Against Socrates' immortal soul, Simmias' countermove proposes a soul that necessarily perishes with the body. Just as the harmony immanent 'in the harmonized lyre' (*ἐν τῇ ἡρμοσμένῃ λύρᾳ*, 86a1) ceases to exist when the lyre is smashed, so too the soul (according to the Harmony Thesis) dies with the body.

There is no need here to delve into the many details of Plato's sustained refutation of the Harmony Thesis, a refutation which (as numerous commentators have observed) exploits and oscillates between multiple senses of the word *ἁρμονία*.[56] These various senses are carefully distinguished in the second appearance and subsequent refutation of the Harmony Thesis: Aristotle's *De anima* 407b27–408a28.[57] According to Aristotle, soul as harmony admits of two interpretations: harmony is identified either with the combination (*σύνθεσις*) of magnitudes or the ratio (*λόγος*) that governs the combination thereof (408a5–9). In Aristotle's estimation, however, neither of these produces a coherent view of the soul.[58] Moreover, the Harmony Thesis fails to account for a basic psychic faculty, namely locomotion. Hence, for Aristotle, too, the soul cannot be harmony.

At *Politics* 1340b16–18, when discussing educational benefits of music, Aristotle pushes a further distinction: *καί τις ἔοικε συγγένεια ταῖς ἁρμονίαις καὶ τοῖς ῥυθμοῖς εἶναι· διὸ πολλοί φασι τῶν*

[56] The two basic arguments that Plato employs are (1) a nobility argument: soul has dominion over and can oppose body feelings; harmony, however, always depends on the state and arrangement of its components; hence, a harmony cannot act upon its components, and thus the soul cannot be the harmony of the body (this is the argument employed by Plotinus to refute the same at *Enn.* 4.7.8); and (2) a *reductio ad absurdum*: no harmony can be more or less harmonious, hence the Harmony Thesis cannot account for both good and bad souls, as it leads to the absurdity that either a bad soul cannot exist (false) or that no soul is more virtuous than any other soul (equally false). See David Gallop, *Plato: Phaedo.* (Oxford: Clarendon Press, 1975), 156–167; C.C.W Taylor, "The Arguments in the *Phaedo* concerning the Thesis that the Soul is a Harmonia," in *Essays on Plato's Psychology*, ed. Ellen Wagner (Lanham: Lexington Books, 2001), 61–67

[57] On which see Ronald M. Polansky, *Aristotle's* De anima (Cambridge: Cambridge University Press, 2007), 104–122; William Charlton, "Aristotle and the Harmonia Theory," in *Aristotle on Nature and Living Things: Philosophical and Historical Studies Presented to David M. Balme on his Seventieth Birthday*, ed. Alan Gotthelf (Pittsburgh: Mathesis, 1985), 131–150; Rae Langton, "The Musical, the Magical, and the Mathematical Soul," in *The History of the Mind-Body Problem*, ed. Tim Crane and Sarah A. Patterson (London: Routledge, 2000), 13–33.

[58] 408a9–15: That the soul is a harmony in the sense of the combination of the parts of the body is a view easily refutable [. . .]. It is equally absurd to identify the soul with the ratio of the mixture.

σοφῶν οἱ μὲν ἁρμονίαν εἶναι τὴν ψυχήν, οἱ δ' ἔχειν ἁρμονίαν ('There seems to be in us a sort of affinity to harmonies and rhythms. Wherefore many of the wise say, some that the soul is harmony, others that it has harmony'). The distinction between εἶναι ἁρμονίαν and ἔχειν ἁρμονίαν, between the soul's *being* harmony and *having* harmony, is crucial. In a recent study of music's role in Plato's thought, Francesco Pelosi argues, apropos the *Phaedo*'s Harmony Thesis, for Plato's 'recovery and re-employment of this notion [of soul as harmony] in the other dialogues.'[59] To make such a claim, however, flattens out important differences in Plato's deployment of psychological harmonies. For, in fact, none of Plato's other dialogues in any way rehabilitates, much less 're-employs,' the Harmony Thesis. The *Republic* and the *Timaeus* do envisage a harmonic psychology, but on very different terms – different enough, in fact, that they in no way undermine or revise the rejection of the Harmony Thesis in the *Phaedo*. Pelosi's own statements reveal this transformation without admitting it openly. In the later dialogues, Pelosi argues, 'Plato will be moved to reconsider the possibility of seeing harmony *in* the soul.'[60] To posit harmony *in the soul*, however, is not the same as positing the soul *as harmony*. Plato's 'mythic' speculations on the harmonic structures *in* the soul, most fully articulated in the Timaean psychogony, should not and do not, as Pelosi claims, 'ring out as a response to Simmias' objection.'[61] Although Pelosi is correct that the 'harmonic representation of the soul can cohabit with the conviction of the immortality of the soul,'[62] the soul's 'harmonic representation' in the *Timaeus* has little if anything in common with Simmias' Harmony Thesis, as is evident from the simple fact that the Timaean (human) psychogony (*Tim*. 41d4–e2) occurs – at the mythic level – *prior* to the creation of the human body (44d3ff.); this, of course does not demand any sort of real temporal priority, but the ontological priority (cf. 34b10–35a1) suggested by the creation 'myth' is largely incompatible with Simmias' Harmony Thesis.[63] Moreover, far from being the source or cause of harmony, body in the *Timaeus* is in fact the cause of the soul's disharmony (43d4–e4). Thus, with Aristotle, we should make a careful distinction between the Harmony Thesis and the harmonic structure of the soul, between those who claim that the soul εἶναι ἁρμονίαν and those who claim that it ἔχειν ἁρμονίαν. Plato cannot be counted among the adherents to the former, but he does counte-

[59] Pelosi, *Plato on Music*, 181.
[60] ibid., 183, my emphasis.
[61] ibid., 183.
[62] ibid., 183, my emphasis.
[63] Cf. Leonardo Tarán, "The Creation Myth in Plato's *Timaeus*," in *Collected Papers (1962–1999)* (Brill, 2001), 306–309.

nance the latter, the harmonic *structure* of the soul itself. Soul is not the harmony of the body, but it has a harmony of its own.

It is almost exclusively the latter harmonic strain of thought that animates twelfth-century discussions of *musica humana*. One reason for the near exclusion of the Harmony Thesis in the twelfth century is the simple fact of the availability of texts: twelfth-century philosophers did not have direct access to the thesis as presented in either the *Phaedo* or the *De anima*. Although Henricus Aristippus, archdeacon of Catania, translated the *Phaedo* into Latin in 1156, the impact and influence of this translation was not felt until the thirteenth century and even then only faintly, never approaching the ubiquity of the *Timaeus*.[64] Aristotle's *De anima*, available by at least the mid-twelfth century in the Latin translation of James of Venice, was not incorporated into the standard philosophical curriculum until the very end of the twelfth and beginning of the thirteenth centuries.[65] Thus, the Harmony Thesis in its classical form was largely unavailable and generally unknown until the thirteenth century.

There were, however, at least four other pre-eminent authorities – Cicero, Augustine, Nemesius of Emesa, and Macrobius – who transmitted a version of the Harmony Thesis. While these authorities certainly *were* known, cited, and debated, their presentations of the thesis would hardly have recommended it as a viable position; each discusses (and dismisses) the view within a doxographical context, enumerating it among the errors of his philosophical predecessors (the fact that none agrees as to who held this view serves well to highlight the complexity of the tradition).[66] More pointedly, however, each presents it as entailing the soul's mortality. Cicero's summary of views on the soul in *Tusculanae disputationes* 1.10.19 (= Aristoxenus fr. 120a) begins with the 'last of the

[64] See Raymond Klibansky, *Continuity of the Platonic Tradition During the Middle Ages. Outlines of a Corpus Platonicum Medii Aevi* (London: The Warburg Institute, 1939), 27–28; Raymond Klibansky, ed., *Phaedo interprete Henrico Aristippo*, Corpus Platonicum Medii Aevi (London: The Warburg Institute, 1950).

[65] There are occasional echoes of the *De anima* in the later twelfth century in Hermann of Carinthia's *De essentiis*, Costa ben Luca's *De differentia animae et spiritus liber* (translated by John of Spain), and Dominicus Gundissalinus' *De anima*. Such citations, however, are usually second hand, indebted not to James of Venice's translation, but to the brief citations of the *De anima* in Calcidius, *In Tim.* 222 (235.8–9) (at uero Aristoteles animam definit hactenus: anima est prima perfectio corporis naturalis organici possibilitate uitam habentis = *De anima* 412a27f.) and Nemesius, *Prem. phys.* 2.4 (Aristoteles vero eam [sc. animam] dicit esse explementum primum corporis naturalis officialisque, potestate vitam habentis).

[66] The root of this doxographical tradition may well be Aëtius' (presumed) *Placita philosophorum*. On which, see Jaap Mansfeld, "Doxography and Dialectic. The *Sitz im Leben* of the 'Placita,'" in *Aufstieg und Niedergang der Römischen Welt*, ed. Wolfgang Hasse and Hildegard Temporini, 36.4 (Berlin: De Gruyter, 1990), 3056–3229. Although Calcidius' treatise on the soul (*In Tim.* 213–235 [228.14–248.14]) is clearly indebted to the same doxographical tradition, the Harmony Thesis is nowhere mentioned or discussed explicitly. On Calcidius' 'doxographical pattern,' see Gretchen Reydams-Schils, "Calcidius on the Human and the World Soul and Middle-Platonist Psychology," *Apeiron* 39 (2006): 178–192.

ancients' and attributes to Aristoxenus, *musicus idemque philosophus*, the view that the soul is 'a kind of tension in the body, as if in song or strings, which is called ἁρμονία.'[67] Thus, upon the death of the body, the soul too will dissolve.[68] Augustine's *De immortalitate animae* (at 2.2 and 10.17) briefly floats the theory that the soul is the *harmonia corporis* (2.2) or *aliqua temperatio corporis* (10.17).[69] In both passages, however, he denies the thesis, since it would force the soul to be, like shape or color, inseparably present in the body,[70] and thus the soul would be as mutable as the body (2.2) and could not withdraw from the body to perceive *intellegibilia* (10.17).[71] The *De natura hominis* by a fourth-century Greek patristic theologian, Nemesius of Emesa, which was translated in the eleventh century by Alfanus of Salerno as the *Premnon physicon*, lists among the *antiquorum omnium sententiae de anima diuersae* (2.1)[72] the view of a certain 'Dinarchus' (Δείναρχος = Δικαίαρχος in Ps.-Plutarch and Stobaeus), who claimed that the soul is the 'harmony of the four elements' (*harmonia quattuor elementorum*), which Nemesius (as translated by Alfanus) glosses as: *temperantiam et concordiam elementorum, non constantem ex vocibus, sed in corpore calidorum et frigidorum et humidorum et siccorum concordem temperiem* (2.4). The arguments Nemesius mounts against 'Dinarchus' are those given by Socrates against Simmias.[73] Thus, even if the *Phaedo* itself was not widely available in the twelfth century, the *Premnon physicon* – which was known and cited by William of Conches,

[67] *Tusc.* 1.10.19: Aristoxenus musicus idemque philosophus ipsius corporis intentionem quandam, velut in cantu et fidibus quae ἁρμονία dicitur: sic ex corporis totius natura et figura varios motus cieri tamquam in cantu sonos.

[68] *Tusc.* 1.11.24: si [anima] est Aristoxeni harmonia, dissoluetur. For a brief discussion of how this view would cohere with Aristoxenus' music theory in general, see Gioia Maria Rispoli, "La musica e le forme," in *La Musa dimenticata. Aspetti dell'esperienza musicale greca in età ellenistica. Convengo di studio Pisa, Scuola Normale Superiore 21–23 settembre 2006*, ed. Maria Chiara Martinelli, Francesco Pelosi, and Carlo Pernigotti (Pisa: Edizioni della Normale, 2009), 135–136.

[69] Cf. *De trin.* 10.9 (on the corporeality and the incorporeality, the mortality and immortality of the soul): sed ipsam temperationem corporis nostri uel compagem primordiorum, quibus ista caro tamquam connectitur, esse opinati sunt. eoque hi omnes eam mortalem esse senserunt, quia siue corpus esset siue aliqua compositio corporis, non posset utique immortaliter permanere.

[70] *De immor. an.* 2.2: quaecumque harmonia corporis est, in subiecto corpore sit necesse est inseparabiliter; Ibid. 10.17: sed in subiecto corpore tamquam color et forma inseparabiliter inesset.

[71] *De immor. an.* 2.2: Mutabile est autem corpus humanum, et immutabilis ratio. Mutabile est enim omne quod semper eodem modo non est. [...] Nullo modo autem potest, mutato subiecto, id quod in eo est inseparabiliter non mutari. Non est igitur harmonia corporis animus. Nec mors potest accidere immutabilibus rebus. Ibid. 10.17: non ullo modo se ab eodem corpore ad intellegibilia percipienda conaretur avertere. On the ambiguity of Augustine's *temperatio*, see Robert J. O'Connell, *St. Augustine's Early Theory of Man, A.D. 386–391* (Cambridge, Mass.: The Belknap Press of Harvard University Press, 1968), 140–142.

[72] On the organization and sources of Nemesius' doxography generally see Heinrich Dörrie, *Porphyrios' "Symmikta Zetemata." Ihre Stellung in System und Geschichte des Neuplatonismus nebst einem Kommentar zu den Fragmenten*, Zetemata: Monographien zur Klassischen Altertumswissenschaft 20 (Munich: Verlag C.H. Beck, 1959), 111–151; Mansfeld, "Doxography and Dialectic," 3076–3082.

[73] *Prem. phys.* 2.32: Quia vero Dinarchus harmoniam esse diffinivit animam, – contra dicens enim Socrati animam harmoniam dixit esse, dicens imitari animam harmoniam, corpus vero lyram – exponendum igitur huius solutiones, quae sunt in Phaedone Platonis. The summary of Socrates' arguments in the *Phaedo* continues through 2.38.

William of St. Thierry, John of Salisbury, among many others[74] – provided a (albeit not entirely accurate) summary of its primary arguments against the Harmony Thesis; however, it seems not to have been utilized on this score.[75] Finally, within this same tradition, Macrobius' *Commentarii in Somnium Scipionis* 1.14.19 offers a similar doxographic compendium.[76] The fourth of his nineteen *sententiae* on the nature of the soul is that of 'Pythagoras and Philolaus' (an attribution not attested in Aëtius), whom Macrobius tells us held the view that *animam esse harmoniam*.[77] In his extensive study of the Philolaean fragments, Huffman argues that Macrobius' attribution of this view to Philolaus may stem more from an 'overreading of the *Phaedo*' (namely, ascribing the view to Philolaus on the grounds that Simmias 'heard' Philolaus at Thebes) than from any direct knowledge of Philolaus' writings or teachings. Nonetheless (Huffman continues) on the basis of the other surviving fragments, 'it might appear that Philolaus was almost trivially committed to the view that the soul is a *harmonia* or attunement.'[78] Huffman's speculative reconstruction of Philolaus' view ('it appears very likely that Philolaus thought of soul in largely material terms as a group of constantly moving elements in attunement located in the heart')[79] is just that: speculative. Regardless, it highlights the fact that the view Macobius attributes to 'Pythagoras and Philolaus' belongs within the tradition of the *Phaedo*'s Harmony Thesis. Yet this was not how the 'Philolaean' definition was received in the twelfth cen-

[74] E.g., *Guillelmi Glos. sup. Tim.* 68.6–7; William of St. Thierry, *De nat. corp. et an.* 1.3–6, 10 (70–77, 80–81); John of Salisbury, *Metalogicon*, 4.20 (uel Premnon physicon legat, librum de anima copiosissime disputantem); Charles Burnett's claim – in "The Chapter on the Spirits in the *Pantegni* of Constantine the African," in *Constantine the African and 'Ali ibn al-'Abbas al-Magusi: the Pantegni and Related Texts*, ed. Charles Burnett and Danielle Jacquart, Studies in Ancient Medicine 10 (New York: E.J. Brill, 1994), 112–113 – that Adelard of Bath 'certainly knew Alfanus's translation of Nemesius, from which he takes Xenocrates's definition of the soul as a harmony in an earlier section of *De eodem et diuerso*,' is inconclusive: Adelard's reference to Xenocrates' definition of soul as *numerus se mouens* (*De eo. et diu.* 46) much more closely corresponds to Macrobius, *In Som. Scip.* 1.14.19 (58.31–32), *Xenocrates [dixit animam] numerum se mouentem* than it does to Nemesius, *Prem. phys.* 2.71: Pythagoras [...] diffinivit et animam esse numerum se ipsum moventem, quod et Xenocrates imitatus exponit. Burnett maintains Nemesius as the source in Burnett, *Conversations*, 78.

[75] The first citation and use of Nemesius *contra* the Harmony Thesis (that I know of) is Albert the Great's *De homine* I, q.4, a.5, as noted by Stephen Gersh, "Ancient Philosophy Becomes Medieval Philosophy," in *Cambridge History of Philosophy in Late Antiquity*, ed. Lloyd P. Gerson (Cambridge: Cambridge University Press, 2010), 913.

[76] For a concise survey of modern views on the source(s) for Macrobius, see Mansfeld, "Doxography and Dialectic," 3073, n. 49.

[77] *In Som. Scip.* 1.14.19 (58.320–59.1).

[78] Carl A. Huffman, *Philolaus of Croton, Pythagorean and Presocratic: A Commentary on the Fragments and Testimonia with Interpretive Essays* (Cambridge: Cambridge University Press, 1993), 327–328.

[79] ibid., 329; a different view is proposed in David Sedley, "The *Dramatis Personae* of Plato's *Phaedo*," in *Philosophical Dialogues: Plato, Hume, Wittgenstein*, ed. Timothy J. Smiley, Proceedings of the British Academy (Oxford: Oxford University Press, 1995), 22–26, who identifies the soul (as a whole) with the harmony of the material bodily elements, primarily the hot and the cold; it is not limited to the heart. In light of Sedley's arguments, which Huffman finds 'quite compelling,' Huffman re-visits Philolaus' conception of the soul in Carl A. Huffman, "The Pythagorean Conception of the Soul from Pythagoras to Philolaus," in *Body and Soul in Ancient Philosophy*, ed. Dorothea Frede and Burkhard Reis (Berlin: Walter de Gruyter, 2009), 21–43.

tury. For the anonymous author of the *Glosae Colonienses super Macrobium*, such a definition simply indicated that *quicumque habent animam capiuntur musica dulcedine*;[80] the larger metaphysical implications were lost in the compression of Macrobius' doxographical presention. William of Conches reads more into the definition, but he too understands the identification of *anima* with *harmonia* more as a matter of metaphor than metaphysics. Properly speaking, *harmonia* is a *concordia uocis*, and thus its application to *anima* can only be understood *quadam translatione*:[81]

> Anima ergo dicitur harmonia quadam translatione, quia harmonice et concorditer corpus uegetat et ex concordia quattuor elementorum habet existere in corpore. Et sunt huiusmodi diffinitiones ut praediximus datae per causam.

We will return to the corporeal, even psychosomatic, implications of this gloss in sections 4.5 and 4.6. First, however, we turn to another commentator who likewise construed the *harmonia animae* as a manner of speaking *per similitudinem*, the anonymous author of the St. Florian commentary on Boethius' *De institutione musica*.

4.4 Psychological harmonies: *per similitudinem*

The St. Florian commentator's fullest discussion of 'psychological harmony' is prompted not by Boethius' brief résumé of *musica humana* but by his claim that music is conjoined to morality. The commentator summarizes the logic of Boethius' argument as follows:[82]

> Quod musica moralitati est coniuncta, quod remittitur dulcibus sonis et offenditur contrariis, inde potest cognosci Platonem non sine causa dixisse animam esse compactam ex musicis consonantiis, cum enim delectetur dulcibus; omnis autem delectatio ex similitudine fit, sicut offensio ex dissimilitudine. Probat enim in se illius habere similitudinem quo ipsa delectatur, et ideo anima ex musicis consonanciis, quoniam in eis delectatur, est compacta.

[80] *Glos. Colonienses sup. Macr.*, comment. ad 1.14.19 (223.16).

[81] *Glos. sup. Macr.*, comment. ad 1.14.19: The soul is called a harmony in a metaphorical sense, because it harmonically and concordantly animates the body and because it derives its existence in the body from the harmony of the four elements. Definitions of this sort, as we have already explained, are causal definitions. Cf. *Guillelmi Glos. sup. Tim.* 78.28–30: Vt igitur animam corpus concorditer mouere significaret, numeros concordes in eius compositione posuit. *Guillelmi Glos. sup. Tim.* 92.9–12: Quamuis anima est coniuncta corpori, quod ex sui natura caret ratione, tamen ipsa est COMPOS RATIONIS, id est potens uti ratione; ET ITEM est compos MODVLAMINIS, id est potens modulandi et regendi corpora.

[82] *In inst. mus.* 27: From the fact that music is connected to morality, that we are soothed by sweet sounds and offended by their opposite, it can be understood that Plato with good reason said that the soul is constructed from musical consonances, since it is delighted by sweet [sounds]; every delight, however, arises from similitude, just as offense arises from dissimilitude. It is proven, then, that the soul has within itself the similitude of that by which it is delighted, and thus the soul is constructed from musical consonances, because it takes delight in them.

Music's connection to morality is predicated upon its ability to affect the soul,[83] and its ability to affect the soul is, in turn, predicated upon some sort of similarity (*similitudo*) obtaining between musical structure and psychological structure. Hence, the structure of the soul is, in a manner of speaking, harmonic. The commentator is at pains, however, to demonstrate that neither Boethius nor Plato before him 'really' thinks that the soul is or has any kind of 'real' harmonic structure, as such a position would undermine the soul's simplicity. We would be wrong to suppose from talk of the 'harmony of the soul' that the soul is a composite entity (as is, necessarily, any concord) or that the soul is a quantity with quantitative parts. To the contrary, the soul is entirely *simplex*, and the soul's musical and thus numerical structure is only a similitude, and this on several levels. First, by describing the soul in numerical terms, Plato intended to highlight the soul's perfection, because number is *perfectissimus* and the first perfection after God (*prima enim perfectio in numeris post deum*).[84] The commentator's wording recalls the language of Macrobius, who similarly noted that *cogitationi a nobis ad superos meanti occurrit prima perfectio incorporalitatis in numeris*.[85] The logic of the argument, however, is fully in line with William of Conches, who, when explaining the numerical construction of the *anima mundi* in Plato's *Timaeus*, made the very same claim: Plato turned to numbers in order to reveal the perfection of the soul, since there is nothing else, after God, that is as perfect as number.[86] Second, even if soul is *simplex*, the commentator continues, we can yet speak of the soul's 'parts' *per similitudinem*. Such parts are not parts proper, but rather are potential or virtual parts (*potentiales siue uirtuales*); that is, they are parts in the sense of the soul's powers: the *uis rationabilis*, *concupiscibilis*, and *irascibilis*.[87] In a properly functioning soul, these virtual parts are

[83] *In inst. mus.* 26: Omnis enim quae animorum est commotiva moralitati est coniuncta, et musica maxime. Ipsa enim lascivioribus sonis animum reddit dissolutum, asperioribus austerum, quarum uterque mores invertit, mediocribus temperatum, quod ad mores pertinet informandos.

[84] *In inst. mus.* 27: Notandum est igitur quod Plato animam dixit esse ex numeris compactam et eam etiam esse ex musicis consonanciis compactam, non quia una res sit compacta, immo simplex est, sed ut notaretur esse quiddam perfectissimum, sicut numerus perfectissimus est; prima enim perfectio in numeris post deum reperitur.

[85] *In Som. Scip.* 1.5.4 (15.10–11); cf. 1.5.13 (17.17–18): prima est igituer perfectio incoporalitatis in numeris.

[86] *Guillelmi Glos. sup. Tim.* 77.9–12: Numeros ergo apposuit ut perfectionem animae insinuaret. Vt enim in principio huius operis diximus, nichil post Deum tam perfectum est quam perfectus est numerus. Cf. 12.18–21: Plato igitur, ut pitagoricus, sciens maximam perfectionem in numeris esse, quippe cum nulla creatura sine numero possit existere, numerus tamen sine qualibet potest existere, ut perfectionem sui operis ostendere, a perfectis scilicet numeris incepit. Cf. Bernard Silvestris, *Comm. in Mart.* 5.53–59: Numerus perfeccionis indicium et concordie causa est. Nulla enim res est tante perfectionis, cum nichil fit quod absque numero possit esse, cum, quicqud est, vel proportiones vel potencias vel etates in numero habeat. Nulla autem res est sine qua numerus esse non possit. Si enim ternarius non esset in his tribus rebus, in aliis esset. Unde Macroibus: 'Cogitationi', inquam, 'a nobis ad superos meanti prima perfectio occurrit in numeris.'

[87] *In inst. mus.* 27: Partes autem, ut prenotavimus, non proprie signantur in anima, sed tantum per similitudinem, et dicuntur partes potentiales sive virtuales, quae et naturam partium virtualium et naturam servant partium integralium.

joined, *sola simililtudine*, such that they produce the same concord and proportion as do concordant *uoces*.[88] How, then, do these virtual parts harmonize? The answer is not particularly sophisticated. The commentator envisages two possibilities: *uel ipsae inter se vel ipsae ad suum principium*. When the soul's virtual parts do what they should do – e.g, when the *rationabilis uis* discerns the good from the bad, the *concupiscibilis uis* pursues the good, and the *irascibilis uis* flees the bad – then the parts harmonize between themselves and their principle, which is the *Bonum* to which the soul returns (*redit enim sic ad suum principium, scilicet, ad bonum*); when, however, the parts decline to do what they should – the *irascibilis uis* flees the good and the *concupiscibilis uis* chooses the bad – then the soul produces dissonance, and it only stretches toward its principle, without attaining it.[89] When the St. Florian commentator reaches Boethius' discussion of *musica humana* proper, he subsumes this virtual tripartition of the soul within the 'Aristotelian' bipartition alluded to by Boethius: *ex rationabili inrationabilique coniuncta est*. The soul's irrational aspect includes *concupiscibilitas* and *irascibilitas*; each of these is, in a manner of speaking, unlimited (*infinitum*) unless it be well-tempered by *rationabilitas*, the soul's *bonus rector*:[90]

> Nam et animae subbiciunt⟨ur⟩ [*scripsi*] cum dicitur: 'anima irascibilis est' et 'concupisciblis est anima' et 'rationabilis est anima', et etiam ista tria quasi unam animae iungunt substantiam. Unde apparet hec [*scripsi*, *Rausch*] non proprie dici partes, quoniam nec in isto genere nec in illo proprie poni possunt. Cf. Boethius, *De div.* 40.24-27: Sed non est anima horum genus sed totum, partes enim hae animae sunt, sed non ut in quantitate, sed ut in aliqua potestate atque uirtute, ex his enim potentiis substantia animae iungitur. Cf. William of Conches, *Guillelmi Glos. sup. Tim.* 79.5–9: est enim anima totum quoddam non uniuersale nec integrum sed uirtuale, quia scilicet plures habet potentias et uirtutes – RVRSVSQVE HOC VNVM, id est unam et eandem animam mundi, DIVISIT IN PARTES non integrales sed in potentias. *Glos. Colonienses sup. Macr.*, comment. ad 1.6.5 (190.12–16): Non credo quod aliquis philosophorum animam constare ex numeris vel habuisse principium ⟨dixerit⟩; sed cum vellent potentias eius describere, nullum eius exemplar tantae evidentiae in rebus invenerunt quam praedictos numeros, id est duplares, qui numeri lucide vires animae ostendunt. *Glos. Colonienses sup. Macr.*, comment. ad 1.6.3 (190.10–11): philosophi non poterunt vires et potentiam animae expressius pronuntiare vel exemplificare quam per proportiones numerourm, que omnia constare faciunt. Hugh of St. Victor, *Did.* 2.4 (27.28–28.5): prima igitur progressio animae est qua de simplici essentia sua, quae monade figuratur, in virtualem ternarium se extendit, ubi iam per concupiscentiam aliud appetat, aliud per iram contemnat, per rationem inter utrumque discernat. [. . .] neque enim vel rationem solam vel iram solam vel concupiscentiam solam tertiam partem animae dicere possumus, cum nec aliud, nec minus sit in substantia ratio quam anima, nec aliud, nec minus ira quam anima, nec aliud, nec minus concupiscentia quam anima, sed una eademque substantia secundum diversas potentias suas diversa sortitur vocabula.

[88] *In inst. mus.* 27: Ex musicis autem consonanciis dixit eam esse compactam sola similitudine, quia scilicet partes anime ita sibi sunt concatenate, ut eandem reddant concordiam et proportionem, vel ipse inter se vel ipse ad suum principium quam concordiam et proportionem faciunt voces ad reddendam musicam consonantiam.

[89] *In inst. mus.* 27–28: Qualiter ergo iste tres partes vel inter se vel ad suum principium musicas reddant consonantias, videamus. Secundum vim rationablim anima bonum a malo discernit, secundum vim concupiscibilem bonum eligit, secundum vim irascibilem malum fugit, et cum hoc, quod facit anima secundum suas partes, tunc partes animae et inter se servant musicas consonancias et ad suum principium; redit enim sic ad suum principium, scilicet ad bonum, redituque suo singula gaudiorum, sed quando secundum has potencias non ita operatur, secundum immo vim irascibilem bonum fugit et secundum concupiscilbilem malum eligit, tunc facit dissonantias, et inter suas potencias et ad suum principium, quia tunc tendit ad suum principium.

[90] *In inst. mus.* 37: Irrationality, however, comprises concupiscence and irascibility, both of which are, as it were, vices. For each of them is somehow unlimited, unless [it be limited] by a certain good ruler, namely rationality, which tempers through a kind of moderation.

> irrationabilitas autem comprehendit concupiscibilitatem et irascibilitatem, quae duo quasi vicia quedam sunt, naturaliter enim utcumque est infinitum, nisi quodam bono rectore, scilicet rationabilitate moderatione quadam temperante.

The language of this passage betrays its Boethian origins; it is not, however, from the *De institutione musica*, but rather from the *De institutione arithmetica*. The St. Florian commentator here draws on the description of the harmony within the soul at *De institutione arithmetica* 1.32, wherein Boethius, following Nicomachus, reveals how the primacy of *aequlitas* to *inaequalitas* pertains not just to numerical calculations[91] but also, at a more fundamental level, to the nature of the universe (*omnem naturae uim rerumque integritatem* = *τὴν τῶν ὅλων φυσιολογίαν*) and the soul in particular:[92]

> bonitas definita et sub scientiam cadens animoque semper imitabilis et perceptibilis prima natura est et suae substantiae decore perpetua, infinitum uero malitiae dedecus est, nullis propriis principiis nixum, sed natura semper errans a boni definitione principii tamquam aliquo signo optimae figurae impressa componitur et ex illo erroris fluctu retinetur. Nam nimiam cupiditatem iraeque immodicam effrenationem quasi quidam rector animus pura intelligentia roboratus adstringit, et has quodammodo inaequalitatis formas temperata bonitate constituit.

As Jean-Yves Guillaumin has commented, this passage betrays 'le substrat philosophique néoplatonicien: dans le monde comme dans le domaine du nombre, l'égalité, qui relève du Même, est plus principielle que l'inégalité, qui relève de l'Autre. Tout peut donc se ramener à l'égalité, même l'inégalité.'[93] Whether by accident or by design, by reading against the grain of the Aristotelian veneer (*ut Aristoteli placet*) of Boethius' psychological division and turning instead to the *De institutione arithmetica*, the St. Florian commentator has paved a way to harmonize Plato and Aristotle in a man-

[91] I.e., the primary subject of the chapter at hand. The method described by Nicomachus and Boethius can be traced, through Theon of Smyrna (*Exp.* 107.15–25ff.), to Adrastus and Eratosthenes.

[92] *Inst. ar.* 1.32 (80.6–15) Goodness, [being] limited, tractable to knowledge (*scientia*), and forever imitable and perceptible to the soul (*animus*), is by nature first and perpetual in the beauty of a substance all its own, whereas the baseness of evil, being unlimited and resting on no principles of its own but by nature forever wandering from the limited nature of the principle associated with the Good, acquires composure by having impressed upon it, as it were, a kind of seal of the noblest form and finds respite from its fluctuating wandering. For, like a kind of ruler, the soul (*animus*), strengthened by pure intelligence, curbs excessive cupidity and immoderate, unbridled irascibility and, in a way, reduces these forms of inequality to a temperate goodness. Cf. *Intr. ar.* 1.23.4–5 (65.1–13). Michael Masi's translation misses the mark entirely: 'it is goodness itself defined which thus comes to knowable form, imitable by the mind. By means of it, primary nature and the infinite ugliness of evil are perceptible through the constant propriety of its substance; it rests on none of its own principles but always by nature is derived from the definition of good principle as though put together by the impress of a good form in some sign, and is saved from the flux and change of error. The mind holds in check excessive cupidity and the immoderate frenzy of anger like one who rules, strengthened by this pure knowledge; this knowledge, tempered by goodness, establishes the forms in inequality' (Michael Masi, trans., *Boethian Number Theory: A Translation of the* De institutione arithmetica, Studies in Classical Antiquity 6 [Amsterdam: Rodopi, 1983], 114).

[93] Jean-Yves Guillaumin, ed. and trans., *Boèce. Institution arithmétique* (Paris: Belles lettres, 1995), 67, fn. 201.

ner similar to that suggested by Guillaumin: *est idem quod Plato aliis verbis dixit, quod anima constat ex eadem et diversa natura*.[94]

A similar nexus of psychological *harmonia* and *potentia* occurs in Macrobius' *Commentarius in Somnium Scipionis*. In his long digression on the nature of the numbers seven and eight (which when multiplied generate the age of Scipio), he describes the harmony of the soul in terms of three and four, which when combined generate seven. The passage is worth quoting in full:[95]

> nec solum explicandis corporibus hi duo numeri conlatiuum praestant fauorem, sed quaternarium quidem Pythagorei quem *τετρακτύν* uocant, adeo quasi ad perfectionem animae pertinentem inter arcana uenerantur, ut ex eo et iuris iurandi religionem sibi fecerint:
>
> *οὐ μὰ τὸν ἁμετέρᾳ ψυχᾷ παραδόντα τετρακτύν*.
>
> per qui nostrae animae numerum dedit ipse quaternum.
>
> ternarius uero adsignat animam tribus suis partibus absolutam, quarum prima est ratio quam *λογιστικόν* appellant, secunda animositas quam *θυμικόν* uocant, tertia cupiditas quae *ἐπιθυμητκόν* nuncupatur. item nullus sapientum animam ex symphoniis quoque musicis constitisse dubitauit. inter has non paruae potentiae est quae dicitur *διὰ πασῶν*. haec constat ex duabus, id est *διὰ τεσσάρων* et *διὰ πέντε*, fit autem *διὰ πέντε* ex hemiolio et fit *διὰ τεσσάρων* ex epitrito, et est primus hemiolius tria et primus epitritus quattuor. quod quale sit suo loco planius exsequemur. ergo ex his duobus numeris constat *διὰ τεσσάρων* et *διὰ πέντε*. ex quibus *διὰ πασῶν* symphonia generatur, unde Vergilius nullius disciplinae expers plene et per omnia beatos exprimere uolens ait, 'o terque quaterque beati.'

The *Glosae Colonienses super Macrobium* divides the passage among several lemmata and makes no attempt to draw together the larger implication of Macrobius' text. The *quaternarius* grants being to the soul insofar as God has bestowed upon soul the four cardinal virtues (*prudentia*, *fortitudo*, *iustitia*, and *temperantia*) or the four *cogitationes* (*sensus*, *imaginatio*, *ratio*, and *intellectus*. The claim that 'wise men agree that the soul consists in musical concords,' however, is taken not as a statement about the human soul but as an observation about the harmonious effect of the World Soul: *Nichil*

[94] *In inst. mus.* 37. There is a second (and less developed) level to the St. Florian commentator's analysis of the harmony within the soul. The commentator briefly suggests that the microcosmic movements of soul parallel the macrocosmic movements in the heavens. This theory will be dealt with in the next chapter.

[95] *In Som. Scip.* 1.6.41 (25.24–26.15): Not only do these two numbers [i.e., three and four] offer a common disposition to form bodies, the Pythagoreans call the quaternary the *tetraktys*, and so revere it among their secrets as pertaining to the perfection of the soul that they have made a religious oath from it: 'By him who gave the quaternary number to our soul.' The number three, indeed, notes that the soul is comprised of its three parts, the first being reason (*logistikon*), the second irascibility (*thymikon*), and the third cupidity (*epithymetikon*). Moreover, all wise men admit that the soul was also derived from musical concords. Among these an important one is the diapason, which consists of two others, the *diatessaron* and the *diapente*. The *diapente* arises from the hemiolic ratio and the *diatessaron* from the epitritic ratio; the first hemiolic number is three and the first epitritic number is four; this we shall discuss more fully in its proper place. Suffice it to say that the *diatessaron* and *diapente* consist in these numbers, and from them the concord of the *diapason* arises. Whence Virgil, schooled in all the arts, when he wished to express that men were fully blessed in all respects, called them 'O thrice and four times blest!' (trans. (lightly modified) William Harris Stahl, trans., *Macrobius. Commentary on the Dream of Scipio*, Records of Civilization: Sources and Studies [New York: Columbia University Press, 1952], 107–108)

aliud est ANIMAM CONSTARE EX SIMPHONIIS *quam quod firmamentum et subiectae sperae, mundana anima inpellente, musicos sonos faciant.*[96] Finally, the Vergilian *terque quaterque beati* encapsulates the three psychological powers (*ratio*, *concupiscentia*, and *ira*) and the four bodily humors (*melancolia*, *colera*, *sanguis*, *flegma*).[97] Theses various triads and tetrads, however, are left unresolved and unrelated, with no explicit connection to the *symphoniae* discussed by Macrobius.[98] William of Conches briefly dwells on the three powers, and his discussion parallels that given by the St. Florian commentator, but he too neglects to comment explicitly on the connection between the powers of the soul and the harmony of the soul.[99] The *quaternarius*, as in the *Glosae Colonienses*, accords with the four cardinal virtues but also to the four elements: *Vel aliter: quaternarius dedit esse animae, quia sunt quattuor elementa, et si non essent, nec corpora; et si non corpora, nec anima haberet esse in corporibus.*[100] 'That the soul consists in musical concords' merely prompts William to delve into an etymological discussion of the term *symphonia* and the various ratios mentioned by Macrobius. The metaphysical implications, again, are completely glossed over.[101] William does, however, grant that the soul may consist in such proportions. Glossing the Vergilian *terque quaterque beati*, he writes: *quantum ad*

[96] *Glos. Colonienses sup. Macr.*, comment. ad 1.6.41–43 (197.15–27).

[97] *Glos. Colonienses sup. Macr.*, comment. ad 1.6.44 (197.28–30).

[98] In his comments on the number seven, however, the author of the *Glosae Colonienses* does briefly allude to a theory similar to that expounded by the St. Florian commentator, but it is applied only to the World Soul. The numbers utilized by Plato (and discussed by Macrobius) in the construction of soul are not employed such that the soul could be constituted from parts or divided into parts, for the soul itself remains *simplicissima*. Thus the number seven refers either to the harmony of the seven spheres (as above) or to the seven principle powers of the World Soul, by which it 'embraces, completes, and penetrates all things'. *Glos. Colonienses sup. Macr.*, comment. ad 1.6.2 (189.29–190.5): Hae proportiones numerorum non ideo assignantur animae, ut ipsa vel consituatur ex aliquibus partibus vel dividatur in partes, sed ideo quia omnia proportionaliter constare faciunt ad similitudinem numerorum. Ipsa enim anima simplicissima est, licet in rebus sit partes habentibus. Vel aliter, scilicet per assignatas proprotiones ostenditur mundana anima caelestem concentum facere in VII speris, quod fit proportionaliter ad similitudinem numerorum per VII discrimina vocum, quae per VII limites possunt notari. Vel aliter, per diversas proportiones et VII limites non notatur aliquas esse partes animae, sed diversae et principales VII eius potestates, scilicet vivificatio, rationalitas, sensualitas, vegetatio, generatio, corruptio et omnium existentia; his enim VII potestatibus omnia ambit, omnia complet, omnia penetret.

[99] *Glos. sup. Macr.*, comment. ad 1.6.42: TRIBVS PARTIBVS, non quod habeat partes ex quibus constat, sed partes uocat in hoc loco animae proprietates. QVARVM PRIMA EST RATIO. Modo uideamus qua necessitate Deus contulit animae has tres potentias. Vidit Deus quaedam homini esse nociua et mala, quaedam minime. Vt ergo homo mala a bonis discernere sciret, animae Deus contulit rationem, id est discretionem mali et boni. Item, quia parum uel nihil prodesset homini discretio nisi appetitum boni haberet et sciret fugere malum, animae eiusdem Deus contulit concupiscentiam de eis quae placent, irascibilitatem de eis quae displicent.

[100] *Glos. sup. Macr.*, comment. ad 1.6.41.

[101] *Glos. sup. Macr.*, comment. ad 1.6.43: ITEM NVLLVS SAPIENTVM. Aliam dignitatem praedictorum numerorum in musicis consonantiis ostendit. EX SYMPHONIIS, id est consonantiis, quia 'sin' con uel simul interpretatur, 'phone' sonus. FIT AVTEM DIAPENTE EX HEMIOLO. 'Hemi' dimidium dicitur, 'olon' totum, inde hemiolius dicitur numerus qui continet alium totum et eius dimidietatem, ut III ad II. Sed ex tali proportione fit diapente, quia duae uoces non possunt facere diapente nisi una contineat alteram et eius dimidietatem. EX EPITRITO. 'Epi' supra, 'tritos' tertium. Quid sint istae consonantiae in sequenti uolumine explicabimus.

animam, quae constat ex proportione quae in istis numeris reperitur.[102] But how does soul consist in such proportions? He does not specify. Even if William was less inclined to speculate on the harmony of the *humana anima per se* and was generally content referring such psychological harmony to its harmonious regulation of the body or its parallels with the *anima mundi*,[103] he found the language of concord, proportion, and harmony a fruitful way of thinking about the construction of the human body and the conjunction of soul with the body, to which we now turn.

4.5 Somatic harmonies: the *corpus organicum*

Timaean Demiurge – in his famous address to the *θεοὶ θεῶν* (41a3ff.) – delegated (*inter alia*) the construction of human bodies and their union with soul to the created gods. They took up the august task (at 42e) with due reverence and, imitating their own creator (*μιμούμενοι τὸν σφέτερον δημιουργόν*), they fashioned human bodies from borrowed portions of the cosmic elements: earth, air, fire, and water. These four they joined together with close-packed and invisible (but still corporeal) fastenings (*ἀοράτοις πυκνοῖς γόμφοις*, 43a3). Although nothing in Plato's highly compressed account suggested any harmonic aspect to the creation of bodies,[104] Bernard of Chartres hints at an underlying proportionality in his gloss on this passage:[105]

> Et EA QVAE ACCEPERANT, id est elementa, CONGLVTINABANT, id est coniungebant, sed NON tam firmis NEXIBVS, sicut sua corpora, SED ALIIS GOMPHIS INVISIBILIBVS, non quia corpora non sit, sed OB INCOMPREHENSIBILEM BREVITATEM. Gomphi proprie dicuntur quaedam instrumenta ferrea, quibus adhaeret ostium, recurua ut hami. Hic uero dicit gomphos quaedam colligamenta partium corporis, scilicet coaceruationem minorum corpusculorum proportionaliter in corporibus dispositam.

[102] *Glos. sup. Macr.*, comment. ad 1.6.44.

[103] *Guillelmi Glos. sup. Tim.* 1181–11: HAEC DIXIT. Sed quia non est Creatoris promittere et non exequi, ostendit Plato qualiter executus sit promissum, id est creationem humanae animae, more suo deseruiens integumento, huic scilicet quod reliquias illius mixturae ex qua animam mundi commiscuerat in eodem uase posuit et inde animam fecit. Cuius haec est ueritas: anima hominis ex reliquiis mundanae animae est facta quia ut illa ex diuidua substantia et indiuidua et ex eadem natura et diuersa facta est et ut illa mixtura in septem partes proportionaliter est diuisa et ut interualla binisi medietatibus sunt fulcita, sic et anima hominis. Sic erto ut ea ibi exposuimus cira animam mundi, hic exponantur circa animam hominis.

[104] Suggestively, *πυκνόν* is also a technical music-theoretical term referring to two 'close-packed' intervals in the chromatic and enharmonic tetrachords. Plato was doubtless familiar with the usage (cf. *Rep.* 531a: *πυκνώματ' ἄττα*), but I don't think any music-theoretical word-play was intended in this passage.

[105] *Bernardi Glos. sup. Tim.* 7.5–11: And WHAT THEY TOOK, that is the elements, THEY GLUED TOGETHER, i.e, they joined together, but NOT WITH BONDS so firm as those that held together their own bodies, BUT WITH OTHER GOMPHI, WHICH WERE INVISIBLE not because they were incorporeal but BECAUSE OF THEIR IMPERCEPTIBLE SMALLNESS. The term 'gomphi' properly refers to certain iron implements, bent like hooks, that hold doors closed. Here, however, he intends by 'gomphi' certain ligaments that join the body's parts, namely an aggregate of small bodily particles proportionally disposed within bodies.

Bernard drew his primary explanation of the *gomphi* – *coaceruationem minorum corpusculorum* – from Calcidius' commentary,[106] but the specification that the *coaceruatio* was *proportionaliter disposita* seems to be Bernard's own contribution. He leaves it at that, however, and gives no clear indication as to what sort of proportions between what sorts of things were necessary in the *constitutio humani corporis*. By the end of the twelfth century, the 'musicality' of these *invisibiles gomphi* were assumed as a matter of course, so much so, in fact, that in Alan de Lille's *Rhythmus de incarnatione Domini*, which also survives as a monophonic conductus in the tenth fascicle of Florence, Biblioteca Mediceo-Laurenziana, Pluteus 29.1, these *gomphi* take a place amongst other musical terms in the fifth strophe on *musica*:[107]

Dum Factoris et facture
  Mira fit coniunctio,
Quis sit modus ligature
  Quis ordo, que ratio,
Que sint vincla, que iuncture,
  Qui gumphi, que unio,
Stupet sui fracto iure
  Musica proportio.

The thread that connects the vague *proportionaliter disposita* of Bernard's *gomphi* to the explicit musicality of Alan's use of the term is a theory of a humoral and elemental concord. The harmonic constitution of the body through the harmonious union of the humors, themselves a microcosmic mirror of the cosmic elements, is deeply connected to the classical Harmony Thesis, or at least to Nemesius' extended refutation of it. After listing the Platonic arguments against Simmias' proposition, Nemesius continues by engaging and refuting what he identifies as a Galenic version of the Harmony Thesis, namely that the soul is the *crasis* or *temperantia* of the body.[108] Nemesius musters

[106] *In Tim.* 203 (222.10–17): Inuisibiles porro coniunctiones gomphos adpellat, uel minorum corpusculorum coaceruationem ut Diodorus, uel eorundem similium inter se conglobationem formabilem ut Anaxagoras, uel supra dictorum multiformem inplicationem ut Democritus et Leucippus, uel interdum concretionem, interdum discretionem ut Empedocles, concretionem quidem amicitiam, discretionem porro et separationem inimicitiam uocans, uel ut Stoici corporum diuersorum usque quaque concretionem.

[107] On which see Marie-Thérèse d'Alverny, "Alain de Lille et la *Theologia*," in *L'homme devant Dieu. Mélanges offerts au Père Henri de Lubac*, 3 vols., Théologie, 56–58 ([Paris]: Aubier, 1963–1964), vol. 2, 123–125, with an edition at 126–128. When the miraculous joining of creator and creation takes place, what would be the mode of their ligature? What would be the order? What would be the ratio? What would be the links? What would be the junctures? What would be the bonds? What would be the union? Musical proportion is astonished when her rule is broken. These same *gomphi* are deployed in the union of body and soul effected by Concord in Alan's *Anticlaudianus* (7.56–61): Postquam materiem Nature dextra beavit / vultibus humanis, animam Concordia carni / federat et stabili connectit dissona nexu. iunctura tenui, gunfis subtilibus aptat / composito simplex, hebeti subtile, ligatque / federe complacito, carni divina maritat.

[108] *Prem. phys.* 2.39: Galenus autem testari videtur in demonstrativis sermonbius, tamquam nihil de anima appareat loquens; sed est videre ex his, quae dicit, ut magis velit crasin id est temperantiam esse animam (hanc enim consequuntur

five discrete arguments against this view; it is the fifth and final argument that concerns us here:[109]

> corporis et spiritus cum dispositione carnium et nervorum aliorumque bona temperantia est fortitudo, et calidorum et frigidorum et siccorum et humidorum bona temperantia salus est, et moderatio membrorum cum bono colore pulchritudinem efficit corporis. Si igitur harmonia hoc est concordia salutis et fortitudinis atque pulchritudinis anima est, necesse esset hominem viventem nec infirmari nec debilitari nec deturpari. Sed frequenter evenit non unam solum, sed has tres simul eucrasias deperdi et vivere hominem.[110]

The harmony of the bodily elements, the body's *eucrasia*, is not equivalent with the soul, but it is a necessary condition for bodily *fortitudo*, *salus*, and *pulchritudo*. It is the second of these – bodily health – that concerns us here. Galen's theory of *crasis* was available in two other closely related texts: the *Pantegni*, a vast compendium of Greek and Arabic medical science translated from Arabic in the eleventh century by Constantinus Africanus; and the *Ysagoge ad artem Galeni*, also translated from Arabic in the eleventh century by a scholar closely connected to Constantinus, if not Constantinus himself.[111] As Danielle Jacquart has highlighted, the *Ysagoge* and *Pantegni* handle Galen's *crasis* differently; the *Ysagoge* uses *commixtio*, whereas the *Pantegi* employs, 'perhaps for the first time in medical terminology,' *complexio*.[112] Alfanus, Nemesius' translator, opted for a third solution (seen in the passage quoted above), *temperantia*. The twelfth-century medical tradition, in particular the commentaries on the *Articella*, a corpus of medical texts that formed the basic medical curriculum, developed a rich and complex conceptual vocabulary for conceiving this bodily temperament in both physiological and theupeutic terms.[113] A full treatment of the medical tradition extends well beyond the confines of this thesis, and thus I will limit discussion to the appearance of the theory of medically-inspired bodily harmony in the writings of William of St. Thierry and

morum differentiae), ex dictis Hippocratis confirmans rationem.

[109] The first four arguments are: (1) Si igitur corporis crasis est anima, nullum erit inanimatum (2.41); (2) si anima crasis est, cum crases permutentur secundum aetates, et tempora et diaetas et anima permutabitur (2.44); (3) crasis non repugnat desideriis corporis, sed cooperatur (2.45); (4) si crasis est anima, cum crasis sit qualitas, qualitas vero et adsit et absit praeter subiecti corruptionem, et anima separabitur absque subiecti corruptione (2.46).

[110] *Prem. phys.* 2.49: Strength is a good blending of the body and spirit, along with the arrangement of the flesh, nerves, and other bodily parts; health is the good blending of hot and cold, dry and wet; and the beauty of the body arises from the regularity of the bodily limbs, together with a good complexion. If, therefore, the harmony, i.e., the concord, of health, strength, and beauty is the soul, then it would be necessary that man, for as long as he lives, be neither ill, weak, or disfigured. It frequently happens, however, that not only is one, but even all three of these good temperaments (*eucrasias*) are lost at the same time, yet man still lives.

[111] On both, see Danielle Jacquart, "Aristotelian Thought in Salerno," in *A History of Twelfth-Century Western Philosophy*, ed. Peter Dronke (Cambridge: Cambridge University Press, 1988), 411–416, with the bibliography cited there, as well as Charles Burnett and Danielle Jacquart, eds., *Constantine the African and 'Ali ibn al-'Abbas al-Magusi: the Pantegni and Related Texts*, Studies in Ancient Medicine 10 (New York: E.J. Brill, 1994).

[112] Jacquart, "Aristotelian Thought in Salerno," 415.

[113] On which, see Danielle Jacquart and Agostino Paravicini Bagliani, eds., *La scuola medica Salernitana. Gli autori e i testi* (Florence: SISMEL, Edizioni del Galluzzo, 2007).

William of Conches. Despite the famous scuffle between these two authors over the boundaries of (natural-)philosophy and theology,[114] their use of the medical tradition is, in many ways, quite similar.

According to William of Conches, the human body is created from the elements, which give rise to the four humors. These in turn constitute the *homiomira* (*τὰ ὁμοιομερῆ*, the parts of the body that share the same essence, such as bones, flesh, nerves, etc.), which themselves constitute the *organica* (*τὰ ὀργανικά*, the bodily limbs, such as the hand, the foot, etc.). William, following Constantinus, describes this as a process of both composition and (mental) division.[115] The elements, moreover, must be properly and proportionally disposed, as William explains in his gloss on the Timaean *gomphi*:[116]

> Ostenso ex quibus humanum corpus sit excogitatum, subiungit et qualiter dicens: CONGLVTINABANT id est proportionaliter coniungebant EA QVAE ACCEPERANT id est quatuor elementa – aliter enim satisfacere uitae non posset – sed NON TAMEN EISDEM NEXIBVS QVIBVS ILLI sunt conglutinati: hoc quantum ad stellas. Non est enim indissolubilis proportio elementorum in homine ut est in stellis. SED ALIIS GVMPHIS: gumphus est latens coniuctio duarum gantarum in rota. Per gumphum igitur intellexit proportiones elementorum in humano corpore. INVISIBILIBVS quia a paucis intelliguntur; et hoc OB INCOMPREHENSIBILEM BREVITATEM id est subtilitatem.

[114] See Paul Edward Dutton, *The Mystery of the Missing Heresy Trial of William of Conches*, The Etienne Gilson Series 28 (Toronto: Pontifical Institute of Mediaeval Studies, 2006).

[115] Composition, e.g., *Guillelmi Glos. sup. Tim.* 127.18–23: Et nota quod non dicit ex qualitatibus elementorum humanum corpus constare ut quidam gartiones confingunt, garrientes quod si ex igne constaret homo, haberet ignem in barba et sic exureretur, ignorantes qualiter elementa transeant in humores, humores spissati in homiomira, homiomira in organica. *Phil.* 1.21 (49A): Voluit autem iste Constantinus ex quatuor elementis constare humores, ex humoribus spissatis partes tam omiomiras, id est consimiles ut est caro et ossa, quam organicas, id est officiales, ut manus, pedes et similia. Division, e.g., *Guillelmi Glos. sup. Tim.* 59.3–8: Diuiditur enim humanum corpus in organica scilicet in manus, etc., organica in homiomira, homiomira in humores, humores in elementa. Cuius diuisionis pars act, pars sola cogitatione et ratione fieri potest quia, ut ait Boetius, 'uis est intellectus coniuncta disiungere et disiuncta coniungere' (*In Isag.* II.165.3–4). Cf. *Phil.* 1.21 (49BC): Dividitur enim, ut figuraliter dicatur, humanum corpus in organica, scilicet in manus etc., organica vero in omiomira, i.e. consimilia, videlicet in particulas carnis et ossis etc., omiomira autem in humores, melancholiam etc., et humores in elementa, id est in simplas et minimas particulas. Cf. Constantinus, *Pantechni*, Theorica, I, 2 (3): Dissolutio est res in mente conceptas usque ad partes deducere ignotas, uerbi gratia, corpus humanum in membra officialis [...] Compositio dissolutorum ab inferiori ad superiora reductio, ut elementorum in cibum, cibi in humores, [...]. The terminology of *homiomira* and *organica* is drawn from Nemesius, *Prem. phys.* 4.9–13; on which see Theodore Silverstein, "Guillaume de Conches and the Elements: *Homiomeria* and *Organica*," *Mediaeval Studies* 26 (1964): 363–367. Cf. Bernard Silvestris, *Comm. in Mart.* 3.391–397.

[116] *Guillelmi Glos. sup. Tim.* 127.27–36: Having demonstrated from what the human body was constituted, he adds how it was so constituted, saying: THEY GLUED TOGETHER, i.e., they joined together proportionally WHAT THEY TOOK, i.e., the four elements – for otherwise it would be insufficient to confer life – but NOT WITH THE SAME BONDS BY WHICH THEY were glued together. Understand this with respect to the stars. For humans do not have the same indissoluble proportion of elements as stars do. BUT WITH OTHER GOMPHI: a 'gomphus' is the hidden conjunction of two rims on a wheel. Therefore, by 'gomphus' understand the proportions of the elements in a human body. INVISIBLE, because they are understood by very few, and this ON ACCOUNT OF THEIR IMPERCEPTIBLE SMALLNESS, i.e., subtlety.

The Timaean *gumphi* have thus become the *proportiones elementorum* that constitute the human body, and William closely adheres to Plato in attributing the initial forging and continual maintenance of these elemental proportions to the *Dii Deorum*. For Plato, *more suo ad integumentum se transferens*, deems the 'created stars and spirits' the 'Gods of Gods' because they have dominion over the four elements.[117] To those who would charge William with heresy for believing the stars and planets to have such wide dominion over the human body, William replies:[118]

> Si enim uerum est quod planetae calorem et siccitatem, frigus et humiditatem conferunt terris, si uitam herbis et arboribus, si temperiem uel distemperiem humanis corporibus, quid mirum si in conceptione, in utero, in natiuitate, in uita, corpora contrahunt temperiem qualitatum ad diu uiuendum et ad animam conseruendam, uel distemperiem ad contrarium?

William saw the creation of the human body as part of a more generalized process of species differentiation brought about by the heat of the newly created stars. The stars heated the water, causing it to evaporate and reveal the mud of the newly formed earth; this *lutosa terra*, itself now boiling from the heat, bubbled up lumps of this primordial *terra* that became different animals depending on the differing elemental (im)balances of the lumps: those that had more elemental fire became lions; earthy lumps, asses; watery lumps, pigs; and so on. Only an equally proportioned elemental lump can create man (*ex quadam uero parte in qua elementa conueniunt aequaliter, humanum corpus factum est*).[119] William thinks that this natural process can even account for the fact that only a single member of the human species was created in this way, for, according to the authority of Boethius, the *inaequalitas* of the imbalanced lumps that generate the *melancolica*, *flegmatica*, and *colerica animalia* is *numerosa et multiplex*, whereas the *aequalitas* of the balanced elemental lump that is man is *pauca*

[117] *Guillelmi Glos. sup. Tim.* 113.1–7: Finito tractatu de creatione caelestis animalis tam uisibilis quam inuisibilis, transit ad creationem ceteroum animalium, more suo ad integumentum se transferens quod tale est quod, creatis stellis et spiritibus, conuocauit eos Deus in uno conuentu habitaque oratione iniunxit eis officium formandi corpora ceterorum animalium, et maxime hominis, coniungendique animam corpri et conseruandi eam cum corpore, dani cibi incrementa et dissoluendi. 113.24–26: Dicit ergo: O DII DEORVM. Stellae et spiritus dii deorum sunt quia dominantur quatuor elementis quae, ut supra expositum est, dii reputantur. For a longer discussion of William's interpretation of the Platonic injunction to the *dii deorum*, see Dronke, *The Spell of Calcidius: Platonic Concepts and Images in the Medieval West*, 129–133.

[118] *Guillelmi Glos. sup. Tim.* 119.25–30: For if it is true that the planets confer heat and dryness, cold and moisture on the land, life on plants and trees, temper or distemper on human bodies, why should it be surprising if, in their conception, gestation, birth, and life, bodies contract either the temper of [elemental] qualities in order to sustain life and preserve the soul, or the distemper [of the elemental qualities], which has the opposite effect.

[119] *Guillelmi Glos. sup. Tim.* 52.1–23: Sed cum terra ex praecedenti humore esset lutosa, ex calore bulliens, diuersa genera animalium creauit. Et, si in aliqua parte illius plus fuit de igne, nata sunt colerica animalia ut leo; si de terra, melancolica ut asinus; si de aqua, flegmatica ut porcus. Ex quadam uero parte, in qua elementa conueniunt equaliter, humanum corpus factum est. Et hoc est quod diuina pagina dicit Deum hominem ex limo terrae fecisse.

et finita.[120] This general account of the differentiation of species, which remains largely consistent across William's œuvre,[121] led William, in his *Philosophia*, to develop a metaphorical take on the creation of woman from the 'rib' of Adam. William argues that Eve's creation from Adam's rib must be a metaphorical (*non ad litteram*) expression for the earth just around Adam. William sums up the silliness of taking the text at its word by coining a silly word to describe it – surely God would not de-rib (*excostare*) the first man.[122]

In one of William's last works, the *Dragmaticon*, he retracts his *non ad litteram* interpretation of the Genesis account, but he does not temper the naturalistic impulse behind it. Rather, he transfers it from the creation account to that of Fall. The first man, he claims, was perfectly balanced in his four qualities (*primus enim homo inter quatuor qualitates fuit temperatus*), but:[123]

> postquam amoenitate paradisi expulsus in ualle lacrimarum et miseriae in labore manuum suarum coepit uesci pane, suo labore uigiliis ieiuniis cepit desiccari atque naturalis calor extingui. Similiter ex intemperie aeris, ex qualitate cibi et potus. Omnes igitiur ex eo nati, utpote ex corrupto, sunt corrupti, neque postea perfecta sanitas in homine fuit inuenta. Est enim perfecte sanum quod est in homoeomeriis eucraticum et in organicis aequale.

[120] *Guillelmi Glos. sup. Tim.* 52.27–30: Vnde, cum diuersa melancolica facta sint animalia et infinita flegmatica et colerica, unus solus homo formatus est quia, ut ait Boethius in *Arismetica*: 'Omnis aequalitas pauca est et finita, inaequalitas uero numerosa et multiplex.' Cf. *Inst. ar.* 1.21–22 (*ad sensum*).

[121] Cf. *Phil.* 1.23 (55D); *Glos. sup. Boet.* 3.m9.289–301; *Drag.* 3.4.1–5.

[122] *Phil.* 1.23 (56A): ex uicino limo terrae corpus mulieris esse creatum uerisimile est [...] et hoc est quod diuina pagina dicit, deum fecisse mulierem ex latere Adae. Non enim ad litteram credendum est deum excostasse primum hominem.' Cf. the later retraction of this theory in the *Drag.* 3.4.5.40–45: Sed ut esset adiutorium simile illi, inmisso in illo sopore, tulit unam ex eius costis, ex qua mulierem plasmauit. Quod non penuria materiae fecit, sed ut mulierem uiro coniunctam et subditam esse debere significaret et sacrum coniugii confirmaret et ecclesiam, quae ex latere eius in sacramentis profluxit, praefiguraret. Note that William's revised view closely adheres to the criticisms levied by William of St. Thierry in *De erroribus Guillelmi de Conchis* 9.315–328: In creatione uero mulieris palam omnibus legentibus est, quam stulte, quam superbe irridet historiam diuinae auctoritatis, scilicet excostasse Deum primum hominem ad faciendam de costa eius mulierem. Et physico illud sensu interpretans, nimis arroganter ueritati historiae suum praefert inuentum, paruipendens magnum illud sacramentum de quo Apostolus dicit: 'Hoc nunc os ex ossibus meis, et caro de carne mea. Ego autem dico in Christo et in ecclesia.' Augustinus: 'Adam, qui erat forma futuri, rerum imaginem et magnum indicium sacramenti nobis praebuit, immo Deus in illo. Nam et dormiens meruit accipere uxorem, quae de costa eius facta est, quoniam de Christo in cruce dormiente futura erat ecclesia de latere eius dormientis, quia de latere in crucis pendentis lancea perfosso sacramenta ecclesiae profluxerunt.

[123] *Drag.* 6.13.2–3: after he had been expelled from the beauty of paradise and began to eat bread by the labor of his hands in the valley of tears and misery, he began to dry out from his labor as well as the deprivations of food and sleep, and his natural heat began to fade. Similarly, he was affected by the intemperate weather and the quality of his food and drink. His descendants, therefore, born as they were from a corrupt ancestor, have all been corrupted, and never afterward has perfect health been found in humans. For that is perfectly healthy which is well tempered in its homeomeric parts and uniform in its organic parts. (trans. (lightly modified) from Italo Ronca and Matthew Curr, eds., *William of Conches. A Dialogue on Natural Philosophy*, Notre Dame Texts in Medieval Culture 2 [Notre Dame, IN: University of Notre Dame Press, 1997], 147). On the 'hidden moral recesses of *natura operans*' at work in this passage, see Willemien Otten, "Nature, Body and Text in Early Medieval Theology: From Eriugena to Chartres," in *Divine Creation in Ancient, Medieval, and Early Modern Thought: Essays Presented to theRev'd Dr. Robert D. Crouse*, ed. Michael Treschow, Willemien Otten, and Walter Hannam, Studies in Intellectual History 151 (Leiden: Brill, 2007), 252–255.

However, the lack of *perfecta sanitas* is not yet a full bodily *discordia*, for as we will see in the final section of this chapter, it is the harmony of the body (even if an imperfect harmony) that is *conditio sine qua non* for the soul's union with the body.

The first half of William of St. Thierry's *De natura corporis et animae* opens with a theory of the constitution of the body that alternates between *complexio* and *temperantia*, thus betraying, as with William of Conches, the influence of both Constantinus and Nemesius.[124]

> Itaque in corpore animali sua propria est complexio prima et naturalis in ipso elementorum coniunctio, quae si aequalis est et bene composita, ut contraria non impugnentur uel destruantur a contrariis, sed calida temperentur a frigidis, frigida a calidis, sicque de reliquis, bona fit complexio, et consentiente natura fit eucrasia, bona scilicet temperantia quatuor qualitatum. Rebus enim naturalibus in temperamento manentibus, impossibile est humanum corpus ab aliquo morbo infestari, si est, ut dictum est, eucraticum, id est bonae complexionis. His autem distemperatis, necesse est alterari corpus.

Eucrasia, a term that William of St. Thierry seems to have taken from Nemesius, occurs *consentiente natura* – it is, in other words, the result of natural processes. At the beginning of the second section, namely the *De natura animae*, William reiterates the natural quality of the human body in order to draw the distinction between the natural body and the divine soul. The power of life (*ad uiuendum uirtus*) does not, William claims, arise from any single part of the body, *sed auctrice anima a Deo data, plurimis particulis natura ad uitae constitutionem suas occasiones et efficientias inspirans, necessariam quandam et mirabilem et pene inscrutabilem ex omnibus in unum uiuendi facit collationem.*[125] This *mirabilis et pene inscrutabilis collatio* that we call the human body is, as William emphasizes elsewhere in the same work, a harmony that mirrors at the microcosmic level (in bodily humors)

[124] *De nat. corp. et an.* 1.5 (73–75): Thus in an animal's body, its own first and natural complexion is the conjunction of elements within it. If this conjunction is balanced and well composed such that contraries are not assailed and destroyed by contraries, but hot is tempered by cold and cold in turn by hot (and so on), then there is a good complexion and, with nature consenting, good temperament (*eucrasia*) obtains. For when the natural things remain in balance (*in temperamento*, it is impossible for the human body to be assailed by any disease, if it is, as it was said, well-tempered, that is of a good complexion. When, however, these things are distempered, then it is necessary for the body to be altered.

[125] *De nat. corp. et an.* 2.53 (133): but with the God-granted soul as its source, nature, breathing into the many parts the causes and capacities for the constitution of life, makes the necessary, wondrous, and nearly incomprehensible collection of all the parts into one living being. In numerous other passages William grants *natura* (often even *natura prouida*) a creative power: e.g., 30: *Natura* enim *prouida* septem paria neruorum in ipso cerebro fundauit [...]; 1.28 (101): [...] et per poros quos in eis *prouida creauit natura* [...]; 2.52 (131): Nam caetera omnia adiectio quaedam sunt bonorum, quae propter bene uiuere *natura* contulit homini [...]; 2.53 (133): Sunt uero quaedam ex eis *a natura* uitae constitutionibus adiecta, et uitae officinis subseruientia, sine quorum adminiculo suum illae officium implere non possunt, sicut sunt uenter et pulmo et caetera nonnulla.

macrocosmic harmonies (in the cosmological elements): just as the elements of the world are concordant in their diversity, so too are the bodily humors.[126]

The body, then, is a well-harmonized whole – and it came to be likened unto an instrument. The instrumentalized body, in both the musical and non-musical sense of the term, is a metaphor that, as Cherniss has pointed out, extends back to Plato's *I Alcibiades* 130A.[127] The primary source for twelfth-century discussions of the instrumental body, however, is Gregory of Nyssa's *De opificio hominis*, as translated by Eriugena.[128] Gregory is the source, for instance, of William of St. Thierry's claim the body is an instrument (*organum*) and the soul its musician. The beauty of the body's music, moreover, is entirely dependent upon the quality and state of the body, not the beauty of the soul, for as William explains:[129]

> Et sicut in organo musico modulari scientes, aptum artis suae instrumentum inuenientes, sollemniter artis ipsius officium exercent, si uero carie uel uetustate fuerit attritum uel quolibet euentu turbatum, artifex quidem de arte nil perdit, organum uero inactuosum manet et absonum, sic et animus totum corporis organum obtinens, et intellectualibus operationibus singulas partes sicut consueuit tangens, in his quidem quae [*scripsi*, qui *Lemoine*; cf. *De imag.* 12 (224.3)] secundum naturam disponuntur quod suum est operatur, in his uero quae infirmantur artificialem sui motum pigrum habet et inactuosum. Vnde et natura organum corporis usui rationis per omnia componit et coaptat.

[126] *De nat. corp. et an.* 1.11 (81–83): Eodem enim modo elementa operantur in mundo maiori quo operantur quatuor humores in mundo minori qui est homo, id est microcosmos, ut supra dictum est, ex sua sibi diuersitate concordantia et per concordem diuersitatem facientia pulcherrimam ordinis sui unitatem. Cf. Alan de Lille, *De pl. nat.* 6.6: Ego sum illa, que ad exemplarem mundane machine similitudinem hominis exemplavi naturam, ut in eo velut in speculo ipsius mundi scripta natura compareat. Sicut enim quatuor elementorum concors discordia, unica pluralitas, consonantia dissonans, consensus dissentiens, mundialis regie structuram conciliat, sic quatuor complexionum compar disparitas, inequalis equalitas, difformis conformitas, diversa idemptitas, edificium corporis humani compaginat. Et que qualitates inter elementa mediatrices conveniunt, eedem inter quatuor humores pacis sanciunt firmitatem. Cf. Anonymus, *Exp. in Mart.* 50r: nam ex seminis particulis proportionaliter sibi commixtis hominis corpus producitur, et quatuor elementa (sicut in mundi constitutione, quoniam microcosmus est) proportionaliter aptantur.

[127] Harold Cherniss, *The Platonism of Gregory of Nyssa*, University of California Publications in Classical Philology 11 (Berkeley: University of California Press, 1934), 72, n. 67. Plato's examples are the shoemaker and his tools, the harpist and the harp (*Ἆρ᾽ οὖν οὕτως καὶ οἷς ὁ κιθαριστὴς κιθαρίζει καὶ αὐτὸς κιθαριστὴς ἄλλο ἂν εἴη·*).

[128] On which, see (with care) Bruce W. Holsinger, *Music, Body, and Desire in Medieval Culture: Hildegard of Bingen to Chaucer*, Figurae: Reading Medieval Culture (Stanford, CA: Stanford University Press, 2001), 46–53.

[129] *De nat. corp. et an.* 2.66 (149): Just as those who know how to make music on a musical instrument, upon finding an instrument suited to their art, well exercise the office of their art, but if the instrument is worn by rot or age or damaged by some accident, although the artist loses nothing of his art, the instrument still remains unresponsive or silent; so too the intellectual soul takes possession of the whole instrument of the body, and touching each part singly in its intellectual operations as is is wont, in those parts which are naturally disposed, it accomplishes its own operations, but in those which are weakened, its operation is sluggish and inactive. Whence, nature prepares and adapts the instrument of the body to the use of reason in everything (= *De imag.* 12 [223.44–224.5]). Cf. *Prem. phys.* 2.51: Corpus namque organum id est instrumentum existens animae, si quidem congrue adaptetur, cooperatur animae ipsumque convenienter habet; si vero incongrue, obstat et tunc usus rerum animae oppugnatur ab incongruitate organi; et si nimis repugnaverit, ad illud quoque convertitur, quemadmodum musicus simul peccat cum distortione lyrae, nisi prius eam bene correxerit. Ideo igitur usus animae est ex congruitate corporis, ut componat illud organum sibi congruum. Hoc autem facit ratione et maribus, haec quidem intendendo, illa vero remittendo, velut in harmonia, ut ipsa sibi congruum illud componat eoque tamquam organo convenientur utatur, sin autem, ipsa convertetur ad illu; quod saepe contingit.

William continues, still following Gregory, by enumerating the various parts of the body and the ways in which they contribute to its instrumentality: without hands, for instance, man would have been like beasts on all fours and his mouth would have thus had a canine roughness; thus without hands, man could never have had an *articulata uox*. William's soul-musician is an excellent example of what Stephen Gersh has queried as a possible interpretation of Boethius' *musica humana*: 'is it something [. . .] like the process whereby the soul's silent inner thoughts achieve external expression in sound?'[130] This is precisely how William explains the relationship between soul and body. *Musica humana* (though it is never deemed as such in William's treatise) is the soul's expression, which finds voice through the instrument of the body:[131]

> ut plectri instar, dum [sc. animus] oris particulas uoci coaptatas tangit, per talem sonorum formationem interiorem suum loquendo interpretetur motum, ueluti si quis musicae peritus existens, propriam ex passione aliqua non habens uocem, uolens autem manifestam facere musicam alienis uocibus modulatur, per tibias siue lyras artem publicans. Sic animus diuersorum intellectuum inuentor cum ipse incorporeus corporeas dictiones per se non habeat, intelligentiae impetus per corporales sensus sufficit ostendere.

4.6 'Psychosomatic' harmonies: the union of body and soul

Despite the uniform stance of the classical and late-ancient authorities *against* the Harmony Thesis, there is yet one twelfth-century author who approached (independently, it seems, of any of these sources) a similarly 'harmonic' conception of the relation between soul and body. It is Isaac of Stella, who, in his *Epistola de anima* (written later, probably sometime in the 1160),[132] invokes a harmony metaphor in order to affirm what the Harmony Thesis (in all of its varieties) uniformly denied: the immortality of the soul. Isaac describes the body in a manner reminiscent of William of St. Thierry: it is a well-tuned and harmonized instrument that is suited to be played by the

[130] Stephen Gersh, *Concord in Discourse: Harmonics and Semiotics in Late Classical and Early Medieval Platonism*, Approaches to Semiotics 2 (Berlin and New York: Mouton de Gruyter, 1996), 44.

[131] *De nat. corp. et an.* 2.68–69 (151–153): When the intellectual soul touches, like a plectrum, the parts of the mouth adapted for voice, through such a formation of sounds, it expresses in speech its own interior motion, as if it were a skillful musician, who, by some affliction, has no voice of his own but still desires to make music, does so through voices not his own, revealing his art through tibiae or lyres. Since the intellectual soul, the author of diverse thoughts, being itself incorporeal does not have, on its own, corporeal words, it elects to reveal the impetus of its intelligence through the corporeal senses (= *De imag.* 9 [219.9–18]).

[132] I cite the *Ep. de an.* according to the forthcoming edition of Caterina Tarlazzi; for ease of reference, however, I key the citations to the PL column numbers (to be printed in the margins of the new edition). I warmly thank Caterina for generously sharing her edition with me prior to its publication.

rational soul.[133] The soul receives the body gladly, as if it were the instrument of its operation and delight, and upon receiving it, exults with the joy *citharedorum citharizantium in citharis suis* (Apoc. 14.2).[134] Isaac then characterizes the union between body and soul as a *conuenientia* realized *per duas medietates conuenientissimas*: the *sensualitas carnis* (perception) and the *phantasticum spiritus* (imagination), both of which are of a fiery nature and thus what Virgil had in mind when, speaking of souls, he wrote (*Aeneid*. 6.792): *Igneus est illis uigor, et coelestis origio*.[135] Isaac raises the following hypothetical objection: if the soul is present to the body via the medium of *sensualitas*, which is a bodily spirit, then why does the body not live through that spirit after the departure of the soul?[136] To this, Isaac replies that as long as the *sensualitas* has *integritas* and *temperantia*, the soul does not recede from the body, but when it becomes *distemperata* and *disrupta*, the soul unwillingly departs, taking with it all its powers (*sensus*, *imaginatio*, *ratio*, etc.).[137] Isaac then expounds upon the harmonic tinge already implied in the terms *temperantia* and *distemperata*, explaining the relation between soul and body with an extended metaphor that echoes the Harmony Thesis:[138]

[133] *Ep. de an*. 1882A rationali tamen anime compositione sui humani corporis habitaculum mage congruit, quasi rationabilibus et armonicis eius motibus seu numeris summi cithariste plectro obtemperatum et consonum.

[134] *Ep. de an*. 1882B: quasi instrumentum operationis et delectationis illud anima et libenter suscipiat et sollicita custodiat et inuita dimittat et dimissum desiderabunda expectet et in recepto gratulabunda exultet, sicut est apud Iohannem 'citharedorum citharizantium in citharis suis.'

[135] PL 194, 1882C: Per duas etenim medietates conuenientissimas facile et firmae duae dissidentes extremitates necti possunt: quod in magni, ut quidam dicunt, animalis, id est mundi huius fabrica cernere facile est. Conuenientissima autem media sunt animae et carnis, iuxta quod dictum est, et multipliciuus assignari possent, sensualitas carnis, quae maxime ignis, et phantasticum spiritus, quod igneus uigor dicitur. Quidam de animabus loquens, ait: Igneus est illis uigor et coelestis origo. Cf. Bernard Silvestris, who similarly links body and soul with a (single) *spiritus* midway between the two. *Comm. in Mart.* 3.707–731: Hunc spiritum animalem *auram* dicit. Hic plus habet se ad animam quam corpus, quia insensibilis est. Sensus namque non capit ipsos sensus. Plus item se habet ad corpus quam ad anima; est enim ex elementis. Hic animalis spirtus est et dissolubilis. Et quia plus convenit illis quam illa ad invicem, ideo medio interveniente iunguntur in homine. [. . .] Tria hec ergo habet in se homo: corpus et anima divinam, quam hic 'mentem' dicit – de qua alias disputabitur – et habet animalem spiritum, quo medio duo illa conveniunt. Atque hoc est quod dicit: TV, Musica, SOCIAS AVRAM, id est spiritum animalem corporibus, que aura est MENTIS, id est divine anime, quasi famula domine. Superior enim natura, que est mens, inferiorem hanc sensualitatem cohibere debet, quasi diceret: corporis iungis AURAM et hac media mentem. Cf. *Phil.* 4.33 (98D): Tunc enim naturalis virtus per membra discurrere incipit, sine qua vita non potest esse nec anima in corpore.

[136] *Ep. de an*. PL 194, 1882C: Hic fortasse dicet aliquis: si per sensualitatem illam, que spiritus corporeus est, inest anima corpori, quare post ipsius discessum eo spiritu, qui utique uita est, non uiuit corpus?

[137] *Ep. de an*. PL 194, 1882D: Ad quod dicimus: dum illius sensualitatis integritas et temperantia congruens uiuificationi manserit, numquam recedere animam; cum autem distemperata et dirupta, inuitam recedere, secum omnia sua ferre, sensum uidelicet et imaginationem rationem intellectum intelligentiam concupiscibilitatem irascibilitatem, et ex his secundum merita affici ad delectationem siue ad dolorem.

[138] *Ep. de an*. PL 194, 1882D–1883A: The body, as if an instrument, which had previously been whole, well-tuned, and arranged such that it might contain within itself a musical melody and resound when touched, now, on the contrary, lies broken and useless. The instrument, yes, has perished, but the melody or song has not, unless you suppose that the song is only the sound. For the soul, which is not a body, cannot be located anywhere, nor can it approach, reside within, or depart from anywhere. But just as a song or musical melody is present within a musical instrument or the page of an antiphoner, provided the strings or the notes are congruently arranged, when these are so arranged, music approaches, when they are torn asunder, music departs; so too is the relationship (*ratio*) of the soul with its

> corpus autem tamquam organum, quod prius integrum contemperatum et dispositum, ut melos musicum in se contineret et tactum resonaret, nunc confractum et inutile e regione iacere; perisse quidem organum sed non perisse melos siue cantum, nisi tantum sonum cantum putaueris. Neque enim anima, que corpus non est, localis esse potest nec localiter accedere inhabitare uel recedere, sed sicut in organo musico seu antiphonario folio cantus inest siue melos musicum dum corde seu notule congrue disposite sunt, cum autem disponuntur accedit, cum confunduntur discedit, ita et anime est ratio cum suo corpore. Et si queris ubi sit anima post corpus, quero ubi sit cantus post folium aut post sonum [. . .]

Despite the apparent echo of the Harmony Thesis, Isaac's metaphor drifts away from its classical formulation at several crucial points. Firstly and most obviously, Isaac speaks nowhere of harmony. Rather, his language is that of *melos musicum* and *cantus*, musical melody and song, a change that wreaks philosophical havoc on the Harmony Thesis – primarily because these are audible phenomena and thus directly accessible by the senses, which the soul, as an entirely incorporeal entity, is not.[139] Isaac, however, addresses this in his central premise, which turns the Harmony Thesis on its head: 'when the instrument has perished, the melody or song *does not* perish along with it, unless you suppose that the song is only the sound.' For Isaac, then, *cantus* and *melos* are clearly something over and above *sonus*; presumably that something would be the harmonic structures, the musical proportions that give rise to the harmonious sounds and continue to exist even when the sound has fallen silent. Thus, his second departure from the Harmony Thesis: Isaac, in effect, pulls the harmony out of the body and posits it as a quasi-universal that is not solely dependent upon the body but is present within or absent from the body, depending on the body's state. Isaac's argument partly turns on a thought of central importance to Gregory of Nyssa: the soul cannot be localized within the

body. And if you ask me 'Where is the soul after the body?' I ask you, 'Where is a song after you turn the page or after the sound falls silent? This argument was incorporated into the Pseudo-Augustinian *De spiritu et anima* (PL 40, 791) and was later picked up by, among others, Thomas of Cantimpré in his thirteenth-century encyclopedia *Liber de natura rerum*, where it appears in a corrupt but still recognizable form: Corpus autem quod prius integrum tanquam organum contemperatum et dispositum, ut melos musicum in se concineret et tractum [*sic*] resonaret, nunc confractum et inutile e regione iacet (Helmut Boese, ed., *Thomas Cantimpratensis: Liber de natura rerum* [Berlin: Walter de Gruyter, 1973], 2.11.40–42). Bruce Holsinger, not realizing the origin of this phrase, assumed that it was an encapsulation of William of St. Thierry arguments and offered the following (mis)translation: 'For the body, because it is first created well-tempered and ordered, is like a musical instrument, for sweet music harmonized in it and, drawn out, resonates, and when finished is expelled from the unused region' (Holsinger, *Music, Body, and Desire in Medieval Culture: Hildegard of Bingen to Chaucer*, 221). It also appears, explicitly attributed to Augustine, in the *Commentum Oxoniense in musicam Boethii*: Etenim quandiu equalitas, concordia et proporcio humorum per alimentum coprois viguerit, manet anima regens corpus integrum et quasi organum unum contemperatum et dispositum, ut in se melos musicos contineret, secundum Augustinum De spiritu et anima 2°; sed cum omnis dissolucio ex discordia et inequalitate contingat [. . .], post receussum anime corpus quasi confractum et inutile iacet sine regimine (Hochadel, *Commentum Oxoniense in musicam Boethii: Eine Quelle zur Musiktheorie an der spätmittelalterlichen Universität*, 78.30–37).

[139] Such an interpretation of the theory was proposed by A.E. Taylor, who suggested that "'mind" is the tune given out by the body, the music made by the body,' and compared it with the epiphenomenalism of T.H. Huxley (A.E. Taylor, *Plato. The Man and his Work*, 3rd ed., revised and expanded [London: Methuen, 1929]).

body, as the immaterial cannot be contained by the material (*neque enim anima, que corpus non est, localis esse potest nec localiter accedere inhabitare uel recedere*).[140] Isaac's argument, therefore, denies one crucial premise of the Harmony Thesis: that the harmony is somehow localized 'in the tuned lyre' (ἐν τῇ ἡρμοσμένῃ λύρᾳ, *Phaedo* 86a1). Isaac's metaphorically musical soul cannot be explained through epiphenomenalism, supervenient dualism, or any sort of functionalism *avant la lettre* (to list a few modern theories often floated in discussions of the Harmony Thesis). This point is highlighted by a subtle shift in the metaphor. No longer does Isaac speak only in terms of a musical instrument, something that can be tuned, but he adds a quite different sort of analogy: the notes on the page of an antiphoner. When the strings of an instrument or the notes on the page of an antiphoner are properly arranged (*corde seu notule congrue disposite*), melody approaches (*accedit*); when they are in disarray, melody departs (*discedit*).

This shift, from instrument to notation (which will eventually give way to sound itself), reveals the real burden of Isaac's metaphor. He seeks neither to give a robust ontology of the soul nor to explain the soul in terms of any bodily constitution or arrangement; rather, he seeks to illuminate, via a metaphor that would be familiar and accessible to his readers, just how a permanent incorporeal substance can be present to and depart from a transitory corporeal body. And the 'presence' of eternal incorporeal music within a perishable corporeal instrument is only one way of conveying the concept, for Isaac eventually abandons the body-as-instrument metaphor altogether. Asking where the soul is 'after the body' is like asking where the song is after the page is turned or the sound falls silent. The body as a well-tuned instrument is no longer needed to make his point, and Isaac concludes by listing other comparisons that extend well beyond the musical metaphor with which he began:[141]

[140] For this claim, cf. *De op. hom.* 178BC = *De imag.* 16231.26–35; cf. *Periphyseon* IV, 2108–2120: Sed quia non in parte quadam eroum quae in nobis sunt animus comprehenditur, sed aequaliter in omnibus et per omnia est, [...] neque intus existens (non enim in corpore incorporale tenetur) – neque extra comprehendens (non enim circumprenditur in corporale), sed secundum quendam modum superrationabilem et ⟨in⟩intelligibilem appropinquat animus naturae, et coaptatus in ipsa et circa ipsam consideratur, neque intus positus, neque circumplexus. The importance of this claim for Gregory is highlighted and discussed by Cherniss, *The Platonism of Gregory of Nyssa*, 24. Cf. William of St. Thierry, *De nat. corp. et an.* 2.64 (147): Auctor enim naturae intellectualis substantiae ad corporalem societatem et contactum quendam uoluit esse ineffabilem et inintelligibilem, scilicet ut neque intus existat, neque enim in corpore incorporale tenetur, neque comprehenditur a corpore, neque exterius inueniatur eadem naturae lege.

[141] *Ep. de an.* PL 194, 1883A: And if you ask me 'Where is the soul after the body?' I ask you, 'Where is a song after you turn the page or after the sound falls silent? Where is the meaning after the word is spoken? Where is the number when you have finished counting?' Lay out four pebbles and then three more: they make seven. Take away the pebbles, and are not three and four still seven? Hence, countable or counted things, if you will, are a kind of body for number, a sentence is a body for sense, speech a body for meaning, and the harmony of the voice a body for song. Incorporeals are held, so to speak, by all of these corporeals: sometimes they draw close, sometime they pull away.

> Et si queris ubi sit anima post corpus, quero ubi sit cantus post folium aut post sonum, ubi sit sensus post uerbum, ubi sententia post uersum, ubi numerus post numeratum. Pone quatuor lapillos et tres, et sunt septem. Aufer illos: nonne tria et quatuor sunt septem? Numerabilia ergo uel numerata, si placet, quasi quoddam corpus sunt numeri, et sententie uersus, sensus uero sermo, et cantilene modulatio uocis. Quibus omnibus quasi corporibus tenentur incorporea, interdum autem accedunt, nonnumquam uero recedunt.

Bernard McGinn has argued that Isaac identifies the *spiritus corporeus*, rather than the soul, with the harmony of the body and that 'Isaac has used an originally Pythagorean doctrine condemned by Plato to defend the Platonic doctrine of the soul's spirituality and immortal nature.'[142] The shifting terms of Isaac's metaphor, however, which range across concepts as varied as *organum*, *notulae*, *sonus*, and *modulatio uocis*, make any such strict identification nigh impossible. *Pace* McGinn, the *spiritus corporeus* is not the harmony of the body, but then again, neither is the soul. Rather, the soul is present to the body in a manner similar to the presence of music in an instrument, notation, sound, or a vocal melody: for music does not perish when the instrument is broken, when the antiphoner is shut, when the sound is silenced, or when the voice ceases to sing. McGinn is, however, correct to conclude that Isaac's explanation of the harmonious union between body and soul 'cannot be described as a philosophical triumph.'[143]

Isaac's Harmony Metaphor, as we might call it, closely recalls a more naturalistic explanation of the union of body and soul that is found in twelfth-century commentaries on Plato, Macrobius, and Martianus. The commentators knew from Calcidius that the union of body and soul is not to be construed as an *applicatio*, *permixtio*, or *concretio*.[144] Instead, it is a *coniunctio*.[145] But the question

[142] Bernard McGinn, *The Golden Chain: A Study in the Theological Anthropology of Isaac of Stella*, Cistercian Studies 15 (Washington D.C.: Cistercian Publications, 1972), 167.

[143] ibid., 160.

[144] *In Tim.* 221 (234.6–235.7): Societas porro uel ex applicatione fit uel ex permixitione uel ex concretione. Si applicita sint corpus et anima, quid ex applicatione compositum horum duum, quatenus totum erit uiuum? [...] Si uero permixta sunt, anima unum aliquid non erit, sed permixta multa; [...]. Superest, ut ex concretione manent; ergo et per se inuicem transeunt duo corpora et locus unus quo coprus continetur duobus propribus praebebit capacitatem, cum uas quod qauam recipit uinum et aquam simul sapere non possit. Neque igitur ex applicatione neque permixtione neque uero concretione corpus et anima sociantur. As Gersh observes (Gersh, *Middle Platonism and Neoplatonism: The Latin Tradition*, 483–484), these three correspond to Stoic theories of mixture: παράθεσις, μῖξις and σύγχυσις.

[145] Cf. Bernard Silvestris, *Comm. in Mart.* 3.607–615: Solet queri utrum anima sit apposita corpori vel concreta vel commixta vel coniuncta. Si apposita esset, cum omne appositum aliter extra illud sit, et ipsa extra corpus esset. Non ergo equaliter illud moveret. Omne enim appositum in proximo magis viget, ut ignis linee materie appositus. Si concreta esset, ex sua in corporis substantiam transiret, ut ⟨aqua⟩ in lapidem per frigus vel in salem per ebullitionem. Si commixta esset, neutrum eorum esse suum retineret, ut dum aurum et argentum in electrum miscentur. Coniucta ergo sunt corpus et anima. *Drag.* 6.25.1: Cum et corpus et anima in constitutione sunt hominis, uel anima est apposita corpori uel commixta uel concreta uel coniuncta. Sed si apposita illi est, extra ipsum est. Iterum omne quod est appositum alicui fortius exercet uires suas in exteriori parte illius quam in interiori. Ignis enim appositus michi plus me accendit extra quam intus; aqua apposita plus humectat. Sed anima magis exercet uiras suas in nostris interioribus quam exterioribus. Non est igitur corpori apposita. Si iterum corpori mixta esset, ex illis duobus unum fieret, neutro remanente quod prius

remains, what is the *coniunctio* between *corpus* and *anima*? When William is pushed to give a *physica ratio*, one that would go beyond the simple, obvious answer – God joins soul and body – he takes recourse to the language of music:[146]

> Quod uero quaeris, quid eam illi coniungit, quid eam illud amare facit, etsi possem dicere Deus, quia tamen physicam quaeris, accipe. Omni animae amor proportionis et concordiae tantus a Deo est datus, ut etiam in sonis, qui extra ipsam sunt, penitus illam diligat. Et hoc ext quod Plato significare uoluit, cum Deum animam ex musicis consonantiis constituisse commemorauit. Corpora uero humana ex quatuor elementis proportionaliter et concorditer coniunctis sunt constituta. Haec proportio et concordia animam allicit et corpori coniungit et in corpore retinet. Et si uere et proprie uelimus loqui, decemus animam non corpus, non eius qualitates, sed proportionem et concordiam, quibus partes corporis sunt coniunctae, diligere. Vnde ea quae illam proportionem conseruant appetit et quae illam destruunt fugit. Sed ex quo incipiunt elementa discordare, abhorret anima corpus et ab eo separatur.

The harmony of the body is, therefore, the *conditio sine qua non* for the soul's existence in the body.[147] In his commentary on Martianus, Bernard Silvestris connects this bodily harmony to the influence of the celestial spheres and the cosmic elements (in a manner more explicit than what we find in William of Conches). Commenting on *De nuptiis* 1.7, wherein Martianus describes *Psyche* as the daughter of the Sun and Endelechia,[148] Bernard seizes on the opportunity to discuss *de natiuitate animae diuersae [...] sententiae*. Among those discussed is Plato's account of the creation

erat, ut cum aurum et argentum in constitutione electri miscentur. Cum igitur utrumque in homine esse suum retineat, non est mixta corpori. Si corpori concreta est, tunc in qualitatem corporis est uersa, ut aqua in qualitatem salis, quod minime est uerum. Si est illi coniuncta, cum proprius locus spirituum caelum sit, et omnis res quod suum est appetit atque suum contrarium fugit, quid est quod illam tam immundo uasi coniungit? Quid est quod tam immundum quid amare eam facit? Cf. *Phil.* 4.32 (98AB).

[146] *Drag.* 6.25.2–4: As regards your question on what joins the soul to the body, or what makes it love the body, even if I could say,'It is God,' since you ask for a physical explanation, here it is. To every soul such a love of proportion and concord has been given by God that even in sounds, which are outside it, the soul deeply appreciates proportion and concord. And this is what Plato meant to say by mentioning that God constituted the soul from musical consonances. Now, human bodies are constituted from the four elements linked together proportionally and concordantly. This proportion and harmony attracts the soul and joins it to the body and retains it in the body. And if we were to speak truly and properly, we should say that the soul loves not the body, not its qualities, but proportion and concord by which the parts of the body are joined together. So the soul seeks whatever preserves that proportion and shuns whatever destroys it. But as soon as the elements begin to be at variance with one another, the soul shuns the body and separates itself from it. Cf. *Glos. sup. Macr.*, comment. ad 1.13.11: Vere mors est naturalis cum corpus animam deserit, quia quaedam numerorum ratio, id est proportio illa numerorum, et quaedam qualitatum complexio conuincit animam corpori. Quae quamdiu permanserit, non potest fieri naturalis dissolutio. Sed ex quo dissoluitur proportio illa numerorum, naturali dissolutione dissoluitur anima a corpore. Et tunc anima corpus non relinquit, sed corpus illam animam, cum illa proportione dissoluta, non est aptum animari.

[147] Cf. *Glos. Colonienses sup. Macr.*, comment. ad 13.11 (218.1–6): Constat enim corpus ex quatuor elementis proportionaliter collatis ad habilitatem animandi. Vel habet humores IIII item proportionaliter sibi collatos, qui crescunt in diversis temporibus, regnant in diversis etatibus. Cumque ipsa elementa vel ipsi humores incorpore suas servant proportiones, nec deficiunt, nec superhabundant, habile est corpus animari. Deficientibus autem his vel superhabundantibus, corpus negat posse animari.

[148] *De nuptiis* 1.7 (4.10–12).

of souls and the allotment of each soul to its own star (*Tim.* 41de). Although Bernard insists that, if properly understood, Plato says nothing that would contradict catholic doctrine,[149] his interpretation of Plato's text goes so far as to claim that the *anima qua anima* ceases to exist upon the dissolution of the bodily harmony, and his remarks come very close to a quasi-functionalist account of the soul:[150]

> Set numerum stellarum dixit proportionem quam effectu suo dant stelle corpori, id est concordiam caloris et frigoris, humoris et siccitatis, ponderis et levitatis, quam nullus dubitat a stellis et aliis speris haberi. Unde enim alium esst frigus nisi a terra, aqua, luna, Mercurio, Saturno, cum alia mundana frigus naturale non habeant? Vel unde calor nisi a Iove, igne, aere, Marte, sole et Venere? Huic proportioni compar est anima. Ex quo enim adest corpori horum concordia, incipit anima esse: soluta autem eadem, desinit anima esse, non quia substantia illa immortalis desinat esse, set quia ulterius ipsa substantia, licet semper vivat anima, non est anima. Anima enim nomen est officii. Ideoque, completo spatio animationis ipsius, non est ulterius anima.

We arrive, finally, at an anonymous, late-twelfth-century commentary on Martianus (which will be discussed more fully in the next chapter). In an extended gloss on the same passage of the *De nuptiis* (1.7), all the threads that we have been tracing – the body as an elemental harmony, the influence of the stars upon the body, and the soul's bodily existence as a consequence of the body's harmony – are united with a theory of the *celestis armonia*. It is thus a fitting close for this chapter, as it leads us, at last, to the third of the Boethian tripartition, the *musica mundana*.[151]

[149] *Comm. in Mart.* 6.526–527: Set in his verbis non habetur omnes animas simul creatas nec aliquid quod Catholicorum sententie sit obvium.

[150] *Comm. in Mart.* 6.530–542: But he [sc. Plato] called the number of stars the proportion that the stars grant to the body through their effect, i.e., the concord of hot and cold, wet and dry, heavy and light, which no-one doubts is had from the stars and the other spheres. From where else could cold come but the earth, water, the Moon, Mercury, and Saturn, given that other worldly things do not have natural heat. Or from where could heat come save from Jupiter, fire, air, Mars, the Sun, and Venus? The soul is equivalent to this proportion. When the concord of these is present in the body, the soul begins to exist, but when that concord is dissolved, the soul ceases to exist, not because that immortal substance itself ceases to exist, but that substance – although the soul always lives – is no longer a soul. For the soul is the name of a function. And thus, when the duration of its animation is completed, it is no longer a soul. Cf. the more innocuous formulation of William of Conches' *Philosophia* (which he had nonetheless backed away from in the *Dragmaticon* passage cited above), *Phil.* 4.32 (98C): Unde Plato, omnium philosophorum doctissimus, dicit deum creatorem stellis creatis a se et spiritibus curam formandi hominem injecisse, ipsum vero animam fecisse, et illis tradidisse, quia ministerio spirituum et effectu stellarum corpora humana existunt et crescunt, sed sua voluntate creatoris anima existit.

[151] *Exp. in Mart.* (Florence, Bib. Naz. Centrale, Conv. Soppr. I.1.28, ff. 57v–58r; Zwettl, Stiftsbibliothek 313, ff. 145va–b): The soul, therefore, will similarly be called the daughter of the planets, not with regard to its creation but with regard to its incorporation. With the support of the planets, the body is joined together from the hot and the wet, and it is tempered from the four elements in order that it may be a home for the soul that is well suited to be vivified. For as long as these are in effect, the soul is able to remain in the body. For from the planets the human body receives heat, moisture, and nourishment, without which, the soul can not perdure in the body. Because the aforementioned soul [the World Soul] grants motion to the planets, but the motions of the planets dispense the life of man, rightly [the soul] is said to be the daughter of Endelechia and Sun, especially since from each of the planets the soul contracts its various properties, which it retains within the human body. Because of these [planetary] properties, the gods are said to be summoned to the soul's [birthday] banquet, because all the planets convene for the soul's conjunction with the body, as each shows its own effect upon the soul. From Saturn the soul accepts sadness, from Jupiter moderation, from

Planetarum igitur filia dicetur anima similiter, non secundum creationem sed secundum incorporationem. Planetarum enim beneficio ex calido et humido coniungitur corpus. Et ex quatuor elementis temperatur ut uiuificandum aptum sit animae domicilium. Operantibus etenim eisdem [eis *F*] habet anima manere in corpore. Ex his enim calorem et humorem et alimenta accipit corpus humanum, sine quibus in eo anima perseuerare non potest. Quoniam igitur supradicta anima motum planetis prestat, [quoniam – prestat *om. F*] motus uero planetarum uitam hominis dispensat, bene endelichiae ac solis filia perhibetur, presertim cum a singulis planetarum diuersas ipsa contrahat proprietates, quas in humano corpore retinet. Per quas dii ad eius conuiuium corrogati dicuntur [*De nuptiis* 1.7], quia ad eius coniunctionem cum corpore [cum corpore *om. F*] omnes planetae conueniunt, ut singuli singulos in ea ostendant effectus. A Saturno enim tristiciam, a Ioue moderationem, a Marte animositatem, a Venere cupiditatem, a Mercurio interpretandi possibilitatem, a sole calorem ⟨et aestheticon⟩ [*scripsi cum Macrobio*, quieticam *F*, quieticon Z], id est sentiendi uis dicitur, a luna phyticam accipit, quod appelatur incrementum. Vnde etiam Macrobius testatur: per hos circulos descendens, in quibus celestis armoniae concinentia [continentia *F*] consistit, quasdam musicas ad humanum corpus secum trahit consonantias [ad humanum – consonantias *om. F*], quibus illi aptatur, quas aliquando audiens [ardens *F*] in instrumentis, quasi celestis armoniae dulcedinis memor delectatur.

Mars animosity, from Venus cupidity, from Mercury the possibility of interpreting, from the Sun heat and *aestheticon*, i.e., the power of sensation, from the Moon *phyticon*, which means growth. Whence Macrobius attests that, as [the soul] descends through these [celestial] spheres, in which consists the concord of celestial harmony, it pulls along with it certain musical consonances to the human body, by which it is suited to the body. When it sometimes hears these harmonies in instrument, it is delighted, as if reminded of the sweetness of the celestial harmony. Cf. Macrobius, *In Som. Scip.* 1.12.13–14 (50.11–24).

CHAPTER FIVE

MVSICA MVNDANA: COSMOLOGICAL HARMONIES

Two relatively well-known twelfth-century copies of Boethius' *De institutione musica* (Cambridge, University Library, Ii.3.12 and Cambridge, Trinity College, R.15.22, both originating from Christ Church, Canterbury)[1] present a curious amalgam of celestial harmony in an interpolated diagram (Fig. 5.1) that ostensibly illustrates book one, chapter twenty-seven, entitled 'Qui nerui quibus sideribus comparentur.' The diagrams are identical in form, content, even color, suggesting either that they were copied from the same exemplar or that perhaps one was the exemplar for the other.[2] At 1.27, Boethius offers two 'planetary scales': a seven-note scale (unattributed but based upon Nico-

[1] UL Ii.3.12 contains an incomplete catalogue of books from the Christ Church library (facsimile and transcription in Montague Rhodes James, *The Ancient Libraries of Canterbury and Dover* [Cambridge: Cambridge University Press, 1903], 3–12), one of which is a *Musica boetii*, keyed to the *siglum* EE, corresponding to Cambridge, Trinity College, R.15.22, a *Musica Boethii* from Christ Church, which bears on its first leaf the mark EE. UL Ii.3.12 also contains (f. 61v) a famous Romanesque illumination that depicts Boethius, in the upper left quadrant, flanked by Pythagoras, in the upper right, and in the lower half, Plato (left) debates with Nicomachus (right), each bearing in his hand a book inscribed MVSICA (on which see C.R. Dodwell, *The Canterbury School of Illumination, 1066–1200* [Cambridge: Cambridge University Press, 1954], 35ff.). Each of the three scenes is encircled by three descriptive (if flat-footed) leonine hexameters (wrongly transcribed in Margaret Gibson, "Illustrating Boethius: Carolingian and Romanesque Manuscripts," in *Medieval Manuscripts of the Latin Classics: Production and Use*, ed. Claudine A. Chavannes-Mazel and Margaret M. Smith [Los Altos Hills, CA: Anderson-Lovelace, 1996], 128):

> [Boethius:]
> Consul et eximiae scrutator phylosophyae
> Vt uideat uocum discrimina per monochordum
> Iudicat aure sonum percurrens indice neruuum.
>
> [Pythagoras:]
> Pythagoras physicus physicaeque latentis amicus
> Pondera discernit trutinans et dissona spernit.
> Pulsans aera probat quanta quaeque proportio constat.
>
> [Plato and Nicomachus:]
> Edocet ipsorum summus Plato phylosophorum
> Quomodo disparium paritas sonat una sonorum.
> Obuiat instanti ratione Nichomacus illi.

The *Thesaurus Musicarum Latinarum* includes a full transcription of the *De institutione musica* from Cambridge, Trinity College, R.15.22 (available at http://www.chmtl.indiana.edu/tml/6th-8th/BOEMUS1C_MCTC944.html). For a conspectus of both manuscripts, see Margaret Gibson and Lesley Smith, *Codices Boethiani. A Conspectus of Manuscripts of the Works of Boethius. I. Great Britian and the Republic of Ireland*, Warburg Institute Surveys and Texts 25 (London: The Warburg Institute, 1995), nos. 6 (42) and 54 (84–85), respectively.

[2] The second section (from the first half of the twelfth century) of the composite ms Bodleian, Selden Supra 25, also from Canterbury (St. Augustine's), includes a similar diagram at 1.27 (f. 57v), but it remains incomplete (i.e., eight blank concentric circles); on this manuscript, see ibid., no. 201 (214–216).

machus) descending from the *lunaris circulus* (sounding the *nete*) to Saturn (the *hypate meson*);[3] and an eight-note scale extrapolated from Cicero's *Somnium Scipionis* (5.1–2), ascending from the moon (*proslambanomenos*) to the *ultimum caelum* (the *mese*).[4] Both, however, follow the 'Chaldean' planetary order, placing the sun *in medio* (as opposed to the 'Egyptian' order adopted by Plato, in which the sun orbits lower than Mercury and Venus).[5] The interpolated diagram depicts the planetary spheres as eight concentric circles, of which the second from the centre, despite being inscribed with the customary lunar symbol (a crescent moon), is otherwise left blank. The planetary order thus begins with the moon in the third circle (bearing only a generic *stella*) and concludes with Saturn at the outermost periphery. The diagram describes within its planetary rings Boethius' first, Nicomachean scale *ab hypate meson usque ad neten*: the moon is labeled *neten*, Mercury, *paratene sinemmenon*, etc.

Accompanying the diagram's planetary scale, however, is a numeric series that corresponds to a second, very different, formulation of celestial harmony: the 'Timaean' system as formulated by Calcidius. Chapters ninety-five and ninety-six of Calcidius' commentary set forth the *positio planetum* as an intervallic series derived from the harmonic constitution of the *anima mundi*.[6] Calcidius (or his source, Adrastus) envisaged a Platonic cosmic harmony defined not by the identification of each

[3] *Inst. mus.* 1.27 (219.4–1): Illud tantum interim de superioribus tetrachordis addendum videtur, quod ab hypate meson usque ad neten quasi quoddam ordinis distinctionisque caelestis exemplar est. Namque hypate meson Saturno est adtributa, parhypate vero Ioviali circulo consimilis est. Lichanon meson Marti tradidere. Sol mesen obtinuit. Triten synemmenon Venus habet, paraneten synemmenon Mercurius regit. Nete autem lunaris circuli tenet exemplum. Cf. *Harm.* 3 (241.3–242.18), with the translation and commentary in Barker, *Greek Musical Writings II*, 250–253; and *Excerpta ex Nicomacho* 3 (*MSG* 271.16–272.8), the planetary order of which (Moon, Mercury, Venus) corresponds more closely to Boethius' scale (as opposed to the Moon, Venus, Mercury order of *Harm.* 3). Cf. *Inst. mus.* 1.20 (206.10–14): Sed septimus nervus a Terpandro Lesbio adiunctus est secundum septem scilicet planetarum similitudinem. Inque his quae gravissima quidem erat, vocata est hypate quasi maior atque honorabilior, unde Iovem etiam hypaton vocant.

[4] *Inst. mus.* 1.27 (12–25): Sed Marcus Tullius contrarium ordinem facit. Nam in sexto libro de re publica sic ait: Et natura fert, ut extrema ex altera parte graviter, ex altera autem acute sonent. Quam ob causam summus ille caeli stellifer cursus, cuius conversio est concitatior, acuto et excitato movetur sono, gravissimo autem hic lunaris atque infimus. Nam terra nona inmobilis manens, una sede semper haeret. Hic igitur Tullius Terram quasi silentium ponit, scilicet inmobilem. Post hanc qui proximus a silentio est, dat Lunae gravissimum sonum, ut sit Luna proslambanomenos, Mercurius hypate hypaton. Venus parhypate hypaton, Sol lichanos hypaton, Mars hypate meson, Juppiter parhypate meson, Saturnus lichanos meson, Caelum ultimum mese. On Boethius' 'solution' to Cicero's 'vague, ascending moon to firmament progression,' see James Haar, "Musica Mundana: Variations on a Pythagorean Theme" (PhD Thesis, Harvard University, 1960), 178–181.

[5] For a detailed discussion of the various planetary orders, see Georg Wissowa and Wilhelm Kroll, eds., *Paulys Realencyclopädie der classischen Altertumswissenschaft. Neue Bearbeitung* (Stuttgart: Alfred Druckenmüller, 1958), s.v. 'hebdomas,' VI. Die Planetenordnungen bei Babyloniern, Äegyptern, Griechen (vol. 7.2, 2561–2570).

[6] Calcidius likely knew a planetary scale, for at *In Tim.* 72 (120.1–10) he translates ten lines of Hellenistic verse – *sortitos celsis replicant anfractibus orbes*, etc.; see Karl Buechner, *Fragmenta poetarum Latinorum epicorum et lyricorum praeter Ennium et Lucilium*, Bibliotheca scriptorum Graecorum et Romanorum Teubneriana (Leipzig: B.G. Teubner, 1982), 196–197 (no. 18) – dealing with the harmony of the planets (cf. Theon of Smyrna, *Exp.* 139.1–10). Calcidius, however, employs these verses within a discussion of the planetary order and thereby omits the subsequent sixteen lines (as given by Theon, *Exp.* 140.5–141.4), which present the planetary scale. On this poem and its scale, see Haar, "Musica Mundana," 104ff.

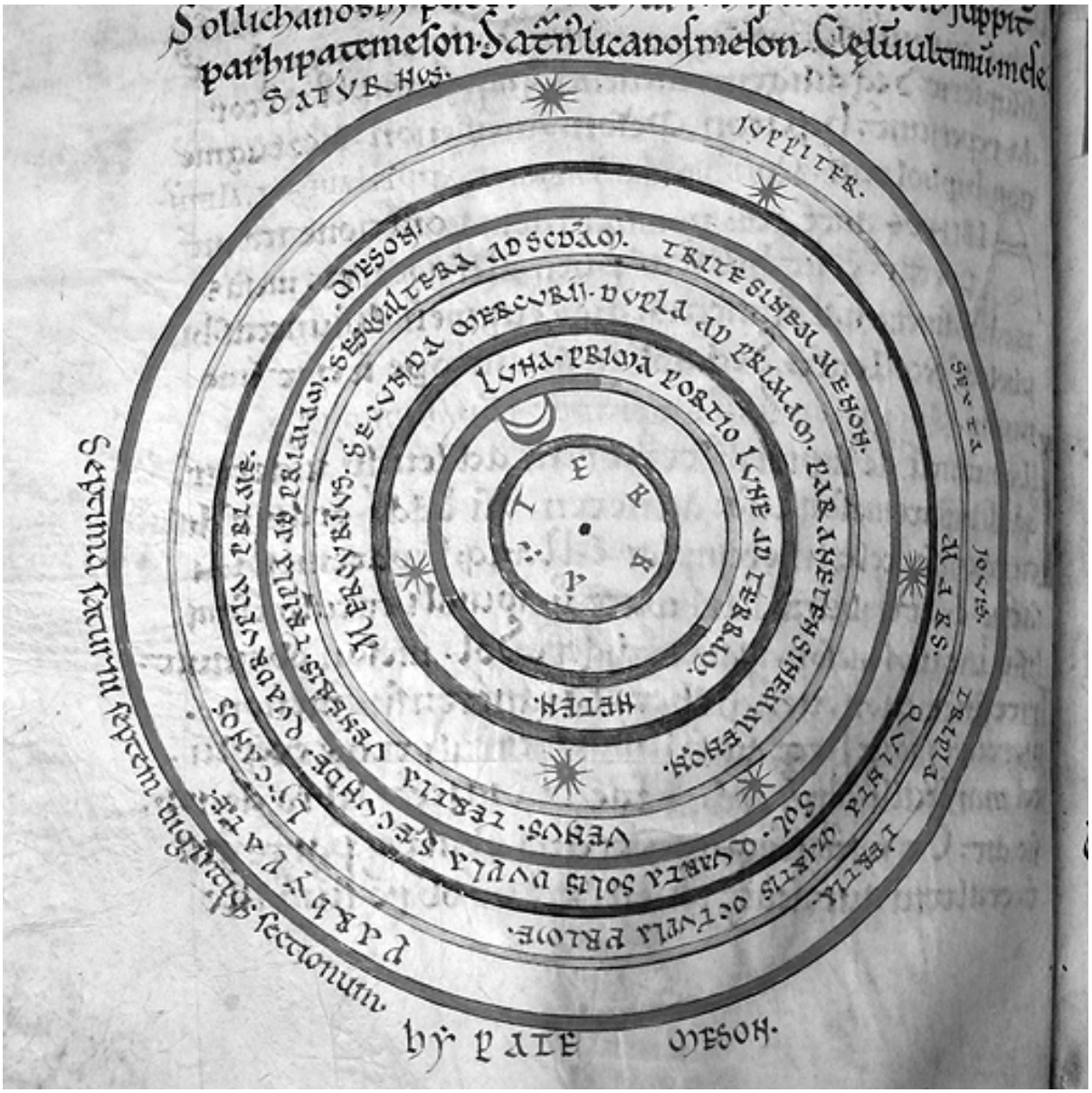


Figure 5.1: Planetary diagram appended to *Inst. mus.* 1.27 from Cambridge, Trinity College, R.15.22, f. 24v

sphere with a specific pitch within the gamut (as in Boethius), but rather by reckoning the successive intervals between the spheres, enumerated in the 'Egyptian' order, in accord with the division of the World Soul.[7] Thus the distance from the earth to the moon corresponds to the soul's first division, the single *portio*, whereas the outermost planet, Saturn, is twenty-seven times as far as the moon from the earth.[8] These planetary distances are visually described by an astronomical diagram that features eight concentric spheres – *terra* at the centre, the *aplanes* at the outermost periphery – with the series 1 2 3 4 8 9 27 inscribed successively within each circle from the *circulus lunae* (1) to *circulus saturni* (27).[9] The outermost *aplanes* – although mentioned in the preceding chapter as part of the celestial harmony[10] – is left with no correspondence to the division of the *anima mundi*, and it is unclear how the fixed stars would fit within Calcidius' system.

Although the Calcidian and Boethian models of celestial harmony differ *toto caelo*, the Calcidian diagram, as well as the chapter it accompanies, likely inspired the interpolated diagram in the Christ Church manuscripts of the *De institutione musica* (and this would help to explain the 'extra' circle in the Christ Church diagram, which does not include the *aplanes*). The text within the diagram reads as follows:

terra
luna · prima portio lunae ad terram · neten
mercurius · secunda mercurii dupla ad primam · paranete sinemmenon

[7] *In Tim.* 95 (147.26–148.5): Tenemus memoria primam psychogoniae descriptionem sic esse formatam, ut unum quidem latus ex duplicibus, alterum uero ex triplicibus numeris sit ordinatum, septemque utrimque limites factos, quorum per singula latera sint interualla terna. Huic ergo adumbrationi, qua depinxit animam, imaginem similitudinis aemulae speciemque mundi deliniat septemque circulos instituit planetum eosdemque aduersum se distare facit interuallis musicis. Cf. *In Tim.* 73 (120.11–13): Pythagoreum dogma est ratione harmonica constare mundum caelestiaque distantia congruis et consonis sibi inuicem interuallis impetu nimio et uelocitate raptatus edere sonos musicos (= Theon, *Exp.* 139.11–140.3).

[8] *In Tim.* 96 (148.12–19): Sectioni quoque partium ex quibus animam constituit positio planetum conueniens uidetur, cum unam ab uniuerso facit sumptam primitus portionem, id est minimam, a terra ad lunam; cuius duplicem secundam, id est quae inter lunam solemque interiacet, cuius triplam tertiam, scilicet Ueneris, quartam duplicem secundae, id est quadruplam primae, Mercurii, octuplam uero Martis, quae quinta sectio est, sextam triplam tertiae, id est regionem seu circulum Iouis, septem porro et uiginti partium Saturni nouissimam sectionem. This system is supposed by Thomas Heath to be an additive system because of Calcidius' specification that the second *portio* corresponds to *quae inter* lunam *solemque interiacet*, not *quae inter* terram *solemque interiacet* (Sir Thomas Heath, *Aristarchus of Samos: The Ancient Copernicus* [Oxford: Clarendon Press, 1913], 164). Such an interpretation, however, would do violence to the strict correspondance between the *positio planetum* and the division of the *anima mundi*. Elsewhere, Calcidius' language is more precise, e.g., *In Tim.* 73 (121.6–8): Plato etiam in hoc ipso Timaeo primam altitudinem a terra usque ad lunarem circulum, secundam usque ad solem liquido dimensus est.

[9] Waszink, *Timaeus a Calcidio translatus*, 149 (wrongly placed in chapter 97, as it illustrates chapter 96). This Calcidian diagram is not included in Bruce Eastwood and Gerd Graßhoff's handlist of Calcidian diagrams: *Planetary Diagrams for Roman Astronomy in Medieval Europe, c.a. 800–1500*, Transactions of the American Philosophical Society 94.3 (Philadelphia: American Philosophical Society, 2004).

[10] *In Tim.* 95 (148.9–11): Erit ergo animae aplanes ratio, planetes ut iracundia et cupiditas ceterique huius modi motus quorum concentu fit totius mundi uita modificata.

uenus · tertia ueneris tripla ad primam, sesqualtera ad secundam · trite sinemmenon
sol · quarta solis dupla secunde, quadrupla prime · meson
mars · quinta martis, octupla prime · lychanos meson
iuppiter · sexta iouis, tripla tertiae · parhypate
saturnus · septima saturni septem uigintique sectionum · hypate meson

The scale is Boethian, the planetary distances Calcidian,[11] and the combination of the two is, ultimately, nonsensical. To my knowledge, the inclusion of this (modified) Calcidian diagram in Boethius' *De institutione musica* is unique to Canterbury sources; nonetheless, it neatly captures two primary themes of twelfth-century conceptions and applications of *musica mundana*: (1) an aggressive syncretism (sometimes to a fault), and (2) the centrality of the Timaean *anima mundi*.

These same themes find concise expression in a second diagram (which unlike the unique Christ Church planetary diagram is ubiquitous in twelfth-century sources), a diagram which, incidentally, serves well to highlight a point of connection between twelfth-century philosophical theory and explicitly music-theoretical writings. The diagram in question appears in the anonymous *Quaestiones in musica* from around the turn of the twelfth century,[12] a critical and skillful compilation of texts primarily from eleventh-century south German theorists who engaged in a reconfiguration of modal theory through critical dialogue with the authoritative Boethian tradition and the innovations of Guido and Pseudo-Odo.[13] The text divides into two basic parts: the first offers a résumé of south German theory (interval species, the tetrachords, the division of the monochord, etc.); the second expounds upon the mathematical foundations of the first part's more practical theory, with frequent recourse to later sections in the Carolingian *Scolica enchiriadis*.[14] The twentieth *quaestio*, falling near the end of the second part, proposes a discussion of the three means (the arithmetic, geometric, and harmonic) in order to determine *qua ratione in sonorum serie toni cum semitoniis contexantur*.[15] In the course of the discussion, based exclusively on *Scholica enchiriadis*,[16] one of the three manuscript

[11] Note, however, that the Calcidian planetary order – *Luna*, *Sol*, *Venus*, *Mercurius* – has been adjusted to match the Boethian scale, enumerated in the order *Luna*, *Mercurius*, *Venus*, *Sol*.

[12] Rudolf Steglich, ed., *Die* Quaestiones in musica*: Ein Choraltraktat des zentralen Mittelalters und ihr mutmasslicher Verfasser Rudolf von St. Trond (1070–1138)* (Leipzig: Breitkopf & Hartel, 1911).

[13] On the 'south German circle' see Thomas J. H. McCarthy, *Music, Scholasticism, and Reform: Salian Germany, 1024–1125*, Manchester Medieval Studies (Manchester and New York: Manchester University Press, 2009), 11–94.

[14] On the *Quaestiones*, see the remarks and further literature cited in ibid., 50–52.

[15] Steglich, *Quaestiones in musica*, 83: Qua ratione in sonorum serie toni cum semitoniis contexantur. [I]d apertius intueri poterimus, si prius, quae arithmetica medietas, quae geometrica, quaeque armonica sit, uideamus. Post proportiones, proportionalitates considerantur.

[16] Cf. *Scholica enchiriadis*: *Δ* Quaeso, qua ratione vel ordine in sonorum serie toni cum semitioniis contexantur. *M*: Id apertius contueri poteris, si prius, quae arithmetica medietas, quae geometrica quaeque armonica sit, pandam. *Δ*: Pande rogo. *M*: Post proportiones proportionalitates considerantur (Hans Schmid, ed., *Musica et scolica enchiriadis una cum*

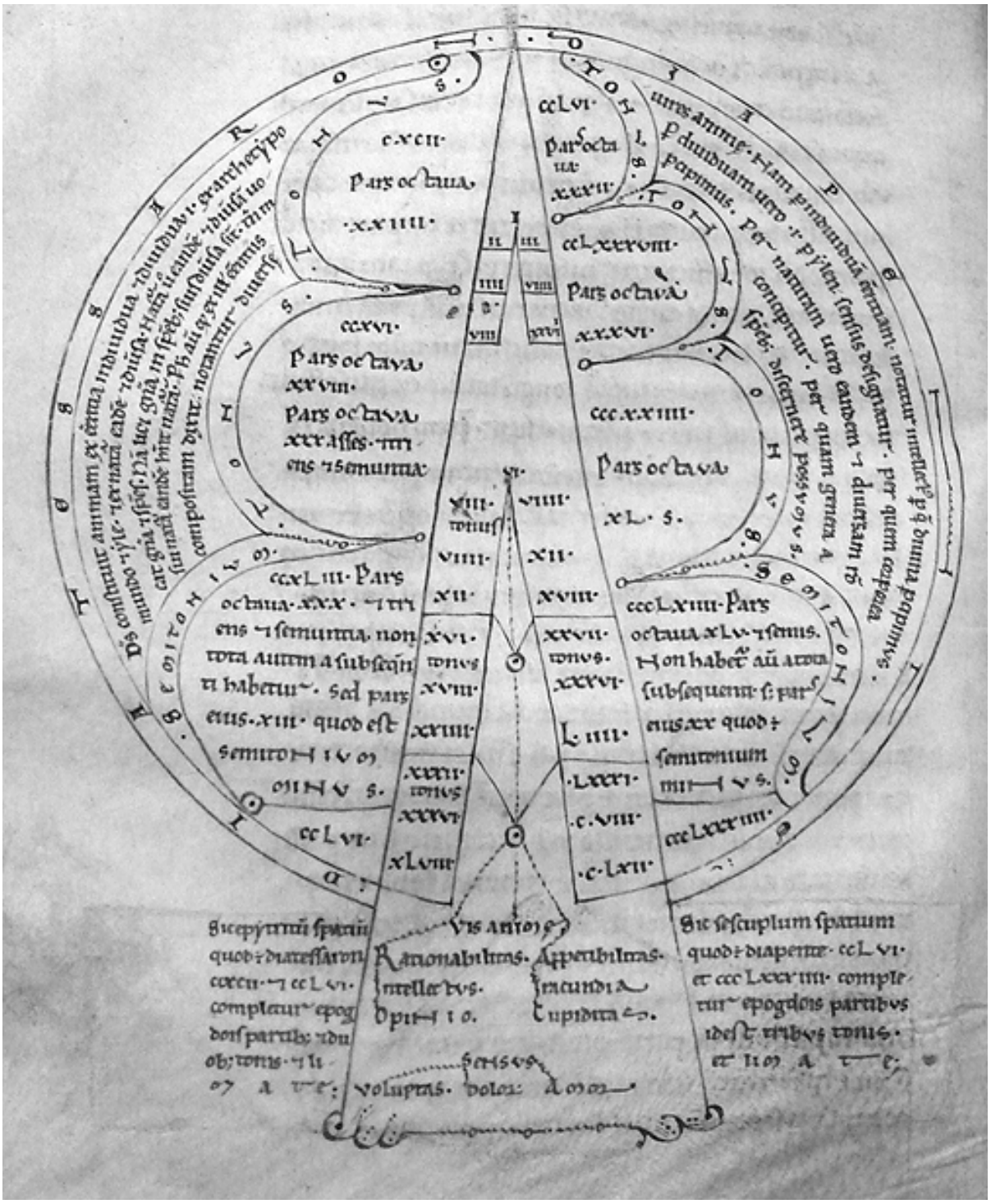


Figure 5.2: Triple lambda diagram included in Macrobius, *In Som. Scip.* 2.2.15; Cambridge, Trinity College, R.9.23, f. 50v

sources for the *Quaestiones* (Darmstadt, Hessische Landes- und Hochschulbibliothek, 1988, f. 140*bis*r) offers a diagrammatic summary: the 'triple lambda diagram' drawn from the pages of the Calcidian *Timaeus*.[17] Michel Huglo has amply demonstrated the wide dissemination of this diagram within the 'premier état' of the textual tradition of the *translato Calcidiii*. Of the eighty-three manuscripts that conserve only the dedicatory epistle and the translation without the commentary, twenty-seven of them (an auspicious number), ranging from the eleventh through thirteenth centuries, contain such a diagram.[18] The diagram included in Darmstadt 1988 is an example of Huglo's category B, 'la forme élaborée et glosée':

> les deux diagrammes VII [the first lambda diagram with an apex of '1'] et VIII [the second lambda diagram with an apex of '6', incorporating the arithmetic and harmonic means] superposés (ou parfois inversés, le VIIe passant au dessus du VIIIe) restent groupés, mais le diagramme IX est refondu en sept demi-cercles chiffrés et annotés; trois demi-cercles sont inscrit sur la jambe gauche du lambda, avec l'inscription *diatessaron* et quatre demi-cercles s'inscrivent sur la jambe droit du lambda, avec l'inscription *diapente*. Un grand cercle englobe l'ensemble du diagramme.[19]

The outermost left and right branches of the diagram – the *diatessaron* (256:192) and *diapente* (384:256) respectively[20] – thus offer one answer to the question posed by the compiler of the *Quaestiones de musica*: *qua ratione in sonorum serie toni cum semitoniis contexantur*. Christian Meyer has deemed the Darmstadt *Quaestiones in musica* a 'très rares témoins de la présence de ce diagramme calcidien dans un environnement musical et donc aussi de la présence de cet horizon intellectuel pythagorico-platonicien chez certains théoriciens de la musique dans les premières décennies du XIIe siècle.'[21]

But this diagram is not so rare as Meyer suggests, and while Huglo has noted its presence in two Macrobian manuscripts (Baltimore, Walters Art Museum, W 22, f. 66 and Munich, UB 8° 375, f. 42r),

aliquibus tractatulis adiunctis, Veröffentlichungen der Musikhistorischen Kommission 3 [Munich: Bayerische Akademie der Wissenschaften, 1981], 140).

17 The diagram is edited in Steglich, *Quaestiones in musica*, 87; it is discussed (with facsimile and edition) in Christian Meyer, "L'âme du monde dans la rationalité musicale: ou l'expérience sensible d'un ordre intelligible," in *Harmonia mundi: Musica mondana e musica celeste fra Antichità e Medioevo. Atti del convegno internazionale di studi (Roma, 14–15 dicembre 2005)*, ed. Marta Cristiani, Cecilia Panti, and Graziano Perillo, Micrologus' Library 17 (Florence: SISMEL, Edizioni del Galluzzo, 2007), Ill. 4 and 74–75.

18 Michel Huglo, "Recherches sur la tradition des diagrammes de Calcidius," *Scriptorium* 62 (2008): especially the 'Liste des manuscrits conservant le diagramme trilambdoïde' at 189.

19 ibid., 188.

20 Both the text and the diagram are based, ultimately, on the series 192 : 256 : 288 : 384 (the thirty-second multiple of the basic series 6 : 8 : 9 : 12), filling in 192 : 256 (the *diatessaron*) with two tones and a semitone as 192 : 216 : 243 : 256; and likewise 256 : 384 (the *diapente*) with three tones and a semitone 256 : 288 : 324 : $364\frac{1}{2}$: 384.

21 Meyer, "L'âme du monde," 67.

still more remains to be said. In the twelfth century, this diagram circulated well beyond the Calcidian Timaeus:[22] it is incorporated within the text of a twelfth-century copy of Macrobius (ad *In Som. Scip.* 2.2.15; Trinity College, Cambridge, R.9.23, f. 50v [Fig. 5.2]); it features in several other glossed copies of Macrobius (e.g., Turin, Bibl. Naz. Universitaria, D.V.38, f. 50r;[23] El Escorial, Biblioteca del Real monasterio de san Lorenzo S.III.5, 126r, etc.); it is appended to a late-twelfth- or early-thirteenth-century compilation of (*inter alia*) glosses on Martianus' *De nuptiis* and Boethius' *Consolatio* (Zwettl, Stiftsbibliothek 313, f. 193v);[24] and, finally, it appears in a twelfth-century bifolium bound at the beginning of Oxford, Corpus Christi College 283,[25] where it accompanies a remarkable collection of texts that encompass arithmetic, music, and natural philosophy, including:

1. 2ra–b: a fragment of Isidore's *Etymologiae* on arithmetic;[26]

[22] This list is not exhaustive; a thorough search for this diagram in all known twelfth-century copies of Macrobius, Martianus, and Boethius is warranted.

[23] Caiazzo, *Glosae Colonienses super Macrobium*, fig. 7.

[24] For a description, see Haijo Jan Westra, "Martianus Capella: Addenda et Corrigenda to Volume II," in *Catalogus translationum et commentariorum: Mediaeval and Renaissance Latin Translations and Commentaries*, ed. Paul Oskar Kristeller and Ferdinand E. Cranz (Washington, D.C.: Catholic University of America Press, 1986), 6: 185–186; Joachim Róssl and Charlotte Ziegler, *Zisterzienserstift Zwettl: Katalog der Handschriften des Mittelalters 4: Codex 301–424*, Scriptorium Ordinis Cisterciensium Monasterii BMV in Zwettl 4 (Vienna and Munich: Schroll, 1997). It is accompanied by a descriptive gloss, which I have not found in any twelfth-century copy of the *Timaeus*, inaugurated by the Timaean lemma *natis itaque limitibus* (*Tim* 36a = *translatio Calcidii* 28.3). The gloss, which is partially copied on f. 192r (through *sint ita duo limites. modo*) and repeated in full on f. 192v, reads as follows: NATIS ITAQVE LIMITIBVS. In hac figura considera composicionem anime. Si monadem [monalem *a. corr.*] in uertice positam uidere desideras, uel si senarium in loco monadis positum disnoscere, utramque figuram inclusam uide. Si uero quomodo interualla tonis et semitoniis complentur agnoscere cupis, considera in capite figure cxcii positum in loco monadis uel senarii. Et ab illo numero, id est cxcii, inferius in uno latere debet poni duplus numerus, in alio triplus, sicut positi sunt in illis figuris in quibus unitas uel senarius sunt positi in uertice. Sed quia in ipsis paruis figuris satis ostensum est quomodo ipsa anima composita sit ex tribus duplis et ex tribus triplis, in hac uero tantum sufficiat considerare quomodo interualla compleantur tonis et semitoniis. Pone ergo ex cxcii in summitate, ut dictum est, et in illo loco in quo posusiti octonarium cum posuisti senarium in uertice, pone modo cclvi, et sint ita duo limites. Modo ad complenda interualla horum duorum limitum tonis et semitoniis, sic dispone. Post cxcii pone ccxvi, post ccxvi pone [c]ccxliiii, post ccxliii pone cclvi. Et sic inuenies consonantiam diatesseron, que noscitur ab extremis limitibus sibi epitrita racione respondentibus. Ducenti enim lvi continet totum cxcii et eius terciam partem, que est lxiv. Ideo est epitrita proportio. Fit autem diatesseron secundum epitritam proportionem. Constant autem duo toni et semitonii in interuallo huius consonancie, ad quos inueniendos in primo loco considera quomodo ccxvi habet se ad cxcii. Et inuenies quod habet se ad ipsum epogdoa proportione, quia contenet ipsum totum et eius octauam partem, id est xxiiii et ex hac proportione nascitur tonus. Ducenti autem xliii consideratus ad ccxvi continet ipsum totum et eius octauam partem, id est xxvii, et est epogdoa proportio, unde tonus. Ducenti enim lvi continet ccxliii et insuper tredecim, quod est minor quam octaua ⟨decima⟩ pars ducentorum xl trium, que octaua decima pars ccxl trium est tredecim et medietas unitatis. Est autem tredecim maior nona decima parte ccxliii, que est duodecim, deficientibus quatuor unitatibus in quatuor partibus ipsorum ducentorum et xl trium. Et ita ducenti lvi nec est sesqualiter nec sesquitercius nec sequioctauus ad ccxliii, et ita non est tonus, sed semitonium intelligitur. Ecce habes in predictorum epitritorum intervallis compleatis duos tonos et semitonium. Ad hunc modum, imple cetera interualla duplorum. Si tres duplos in hac maiori figura posueris, sicut in minoribus positi sunt, ad eundem modum facile implebuntur interualla triplorum in alio latere.

[25] For a description, see Claude Lafleur, *Quatre introductions à la philosophie au xiiie siècle. Textes critiques et étude historique*, Publications de l'Institut d'études médiévales 23 (Montreal and Paris: Institut d'études médiévales, Université de Montréal, 1988), 46–558, with corrections noted below.

[26] Inc.: metiuntur, sed etiam alieno numero procreantur (*Etym.* 3.5.7); expl.: Ergo et dispares inter se atque diversi sunt, et singuli quique finiti sunt, et omnes infiniti sunt (*Etym.* 3.9.2). Lafleur, *Quatre introductions*, 49 deems this an 'Anony-

2. 2rb: a widely circulated gloss on Boethius' *De institutione arithmetica* 1.11;[27]

3. 2va–b: a brief tonary (complete with chant incipits notated with adiastematic neumes),[28] which is a hitherto unnoticed third witness to the *Primi toni differentia*, known from the mid-twelfth-century 'Seligenstadt tonary' (Darmstadt, Universitäts- und Landesbibliothek, 3314/15, 9r–10v)[29] and the Kassel interpolations in the tonary of Theogerus of Metz (Kassel, Landesbibliothek und Murhardsche Bibliothek der Stadt Kassel, 4°Math 1, 28v–31v);[30]

4. 2vb: a short gloss on the elements drawn from William of Conches' *Philosophia* or *Glosae super Platonem*;[31]

5. 2vb: a definition of the diapente and diatessaron that recalls Guido's résumé of the monochord division at *Micrologus* 6.2–5;[32]

6. 2vb: a generic note on the arithmetic and harmonic means;[33]

7. 3r: the 'triple lambda diagram,' flanked on the left by the same note on the division of the tone that appears in the *Quaestiones* interpolation,[34] and on the right by a short gloss on Boethius'

mous, Arithmétique acéphale d'une main du début du XIIIe siècle.'

[27] Inc.: In figura impariter paris numeri . . . ; expl.: Similiter una medietas, id est cxii. This gloss is edited in Oosthout and Schilling, *Anicii Manlii Severini Boethii De institutione arithmetica*, 229. Lafleur, *Quatre introductions*, 49 does not recognize this as a separate text from the first fragment.

[28] Inc.: Primi toni prima differentia duas habet initiales cantus sui litteras .D. et .F. S e u o u a e [= seculorum amen] *Ecce nomen. Senex puerum. Colupna es* F. *Canite tuba. Speciosus. Aue maria. Appropinquabat. Misso hic. Biduo uiuens* . . . ; expl.: Quarta differentia [sc. octaui toni] unam habet initialem litteram .c. S e u o u a e *Veniet fortior*.

[29] The 'Seligenstadt tonary' is incomplete, including only the first four ecclesiastical modes. For an edition and commentary, see Michael Bernard, "The Seligenstadt Tonary," *Plainsong and Medieval Music* 13 (2004): 107–125. It is briefly mentioned in Michel Huglo, *Les tonaires: inventaire, analyse, comparaison*, Publications de la Société francais de musicologie: troisième série 2 (Paris: Société francais de musicologie, 1971), 257.

[30] For an edition of the Kassel interpolations, see Fabian Lochner, "Dietger (Theogerus) of Metz and His *Musica*" (PhD Thesis, University of Notre Dame, 1995), 288–290.

[31] Elementum, ut ait Constantinus in Pantegni, est simpla [al] et minima alicuius corporis particula. Simpla ad qualitatem, minima ad quantitatem. Cuius expositio talis est. Elementum est pars simplia, cuius non sunt contrarie qualitates. Minima, id est, quae est ita pars alicuius quod nichil est pars eiusdem. Vnde littere dicuntur per simile elementa, quia ita sunt partes sillabe quod nichil est pars illarum. Elementa ergo sunt simple et minimae particulae, quibus haec quatuor constant quae uidemus. Haec elementa numquam uidentur, sed ratione diuisionis intelliguntur. Cf. *Guillelmi Glos. sup. Tim.* 58.9–59.3; *Phil.* 1.21 (48D–49B).

[32] Diapente currit ad fine⟨m⟩ monochordi [*add. sup. lin.*] tribus passibus ubicumque circinum apposueris, et fit sesqualtera proportio, ut tres ad duo. Dyapessaron [*sic*] currit ad finem monochordi quatuor passibus ubicumque circinum apposueris, et fit sesquitercia porportio, ut quatuor ad tres. Cf. Waesberghe, *Guidonis Aretini Micrologus*, 6.2–4 (114): Ut autem de divisione monochordi in paucis multa perstringam, semper diapason duobus ad finem passibus currit, diapente tribus, diatessaron quattuor, tonus vero novem, quae quanto passibus numerosiores tanto spatio breviores.

[33] Arithmetica medietas in minoribus terminis maiores habet proportiones et in maioribus terminis minores habet por[tio]tiones. Armonica uero medietas econtrario in maioribus terminis maiores habet proportiones et in minoribus terminis minorres habet proportiones, ut viii ad iiii duplus et iiii ⟨ad⟩ iii sesquitertius et cetera.

[34] Inc.: Quod deest duobus tonis ad complendum sesquitercium est minus semitonio [*recte* semitonium] . . . ; expl. Octaua uero eius pars sunt xxx [*recte* xxxii], dimidia xvi, itaque xiii minor est dimidia parte. For a transcription, see Alison M. Peden, "'De semitonio': Some Medieval Exercises in Arithmetic," *Studi medievali* 35 (1994): 400–401 and Meyer, "L'âme du monde," 74.

Inst. ar. 1.9 (22.27);[35]

8. 3va–b: a short text on the ratio of the minor semitone,[36] a longer text on the mathematical procedure for determining the proper ratio of the minor semitone, entitled 'De Macrobio,'[37] and another brief note on the diatessaron and diapente.[38]

This diagram, originally taking shape among the pages of Calcidius but expanding into both the music-theoretical tradition and the twelfth-century philosophical tradition, is thus an icon of continuity between the two. The diagram is equally at home glossing a music-theoretical discussion of proportional theory, juxtaposed with a tonary representative of south German modal theory, and explaining Timaean and Macrobian discussions of the *anima mundi*. The twelfth-century philosophical tradition is, in a sense, an inversion of the music-theoretical tradition. Where music theorists were led *through* music theory *to* the Platonic division of the world soul, twelfth-century philosophers were drawn *through* the Platonic tradition *to* music theory, to (in the words of Macrobius) the *tonorum vel limmatum minuta subtilia*.[39] The Darmstadt scribe presents the Calcidian diagram as a philosophical gloss, drawn from outside the tradition, that reveals the Platonic orientation of semitone mathematics culled from the pages of the Carolingian *Scholica enchiriadis* (philosophy explains music theory). The twelfth-century philosophers, however, present the music-theoretical background as the primary explanatory grounds for understanding the musical orientation and semitonal implications of the Platonic division of the world soul (music theory explains philosophy).

5.1 The Boethian framework of *musica mundana*

Analysis of this 'highest' form of music, a purely intellectual harmony that aspires toward a cosmological paradigm, must begin with a review of Boethius' classification of *musica mundana*, which is

[35] TANTAMQVE SVMMAM QVANTITATIS INCLVDIT, ETC. Quasi diceret: illud dignum est admiratione quod in qualibet summa pariter paris numeri, quilibet numerus quotam partem ostendit alium numerum in illa summa, tantus ipse est in semet ipso.

[36] Inc.: Si uis uidere si ccxliii ad cclvi reddant semitonium . . . ; expl.: istorum enim differentia est xiii, quod minus est quam x et vii. For a transcription see Peden, "'De semitonio': Some Medieval Exercises in Arithmetic," 401.

[37] Inc.: Liber dicit quod *semitonium tam paruam* [*In Som. Scip.* 2.1.22 (98.27–28)] . . . ; expl.: et ita ad querendam habitudinem semitonii uenies. For a transcription and discussion of this and other related tracts, see Peden, "'De semitonio': Some Medieval Exercises in Arithmetic," 368–369. Peden, however, does not note that the same text on the semitone is found as a marginal gloss to Macrobius (*In Som. Scip.* 2.1.22) in Trinity College, Cambridge, R.9.23, f. 49r (immediately preceding the appearance of the 'triple lambda diagram').

[38] Quemadmodum sesqualterum et sesquitertium arithmetice, ita musicae diapente et diatesseron considerantur. Sicut arithmetice [*add. sup. lin.*] enim in tribus ad duo sesqualtera, et in quatuor ad tria sesquitercia habetur proportio, eodem modo musice in tribus passibus ad duos dyapente, et in quatuor passibus ad tres perpenditur dyatessaron consonantia.

[39] *In Som. Scip.* 2.4.11 (109.6–7).

the longest and most robust description given in his tripartite division:

> Et primum ea, quae est mundana, in his maxime perspicienda est, quae in ipso caelo vel compage elementorum vel temporum varietate visuntur. Qui enim fieri potest, ut tam velox caeli machina tacito siltentique cursu moveatur? Etsi ad nostras aures sonus ille non pervenit, quod multis fieri de causis necesse est, non poterit tamen motus tam velocissimus ita magnorum corporum nullos omnino sonos ciere, cum praesertim tanta sint stellarum cursus coaptatione coniuncti, ut nihil aeque compaginatum, nihil ita commissum possit intellegi. Namque alii excelsiores alii inferiores feruntur, atque ita omnes aequali incitatione volvuntur, ut per dispares inaequalitates ratus cursuum ordo ducatur.[40] Unde non potest ab hac caelesti vertigine ratus ordo modulationis absistere. Iam vero quattuor elementorum diversitates contrariasque potentias nisi quaedam armonia coniungeret, qui fieri posset, ut in unum corpus ac machinam convenirent? Sed haec omnis diversitas ita et temporum varietatem parit et fructuum, ut tamen unum anni corpus efficiat. Unde si quid horoum, quae tantam varetatem rebus ministrant, animo et cogitatione decerpas, cuncta pereant nec ut it dicam quicquam consonum servent.[41] Et sicut in gravibus chordis is vocis est modus, ut non ad taciturnitatem gravitas usque descendat, atque in acutis ille custoditur acuminis modus, ne nervi nimium tensi vocis tenuitate rumpantur, sed totum sibi sit consentaneum atque conveniens: ita etiam in mundi musica pervidemus nihil ita esse nimium posse, ut alterum propria nimietae dissolvat. Verum quicquid illud est, aut suos affert fructus aut aliis auxiliatur ut afferant. Nam quod constringit hiems, ver laxat, torret aestas, maturat autumnus, temporaque vicissim vel ipsa suos afferunt fructus vel aliis ut afferant subministrant.

> First is *musica mundana*, which is especially evident in things observed in heaven itself, in the union of the elements, or in the variety of the seasons. For how could such a rapid, celestial mechanism be moved in a noiseless and silent course? Even if its sound does not reach our ears, which necessarily occurs for many reasons, it would nevertheless be impossible that the swift motion of such great bodies not excite any sound at all, especially since the courses of the stars have been united in such harmony that nothing so equally united or combined could ever be imagined. Some are carried in higher orbits, others in lower orbits, and all are whirled around with such equal rapidity that through their unequal inequalities a fixed order of courses arises. Whence it is impossible that a fixed order of modulation be separated from this celestial revolution. Moreover, unless a kind of harmony united the diversities and contrary powers of the four elements, how could it happen that they come together to produce one body and one mechanism? But all this diversity engenders a variety of seasons and fruits in such a way that the diversity nevertheless produces a singular, unified body of a year. Whence, if you were to pluck off, in mind or thought, something from those things that serve such a variety in things, all would perish, nor, if you'll excuse the expression, would they preserve any kind of

[40] Cf. *Inst. mus.* 1.20 (206.10–16): Sed septimus nervus a Terpandro Lesbio adiunctus est secundum septem scilicet planetarum similitudinem. Inque his quae gravissima quidem erat, vocata est hypate quasi maior atque honorabilior, unde Iovem etiam hypaton vocant. Consulem quoque eodem nuncupant nomine propter excellentiam dignitatis. Eaque Saturno est adtributa propter tarditatem motus et suavitatem soni.

[41] Cf. *Inst. mus.* 1.20 (205.28–206.6): Simplicem principio fuisse musicam Nicomachus refert adeo, ut quattuor nervis constaret, idque usque ad Orpheum duravit, ut primus quidem nervus et quartus diapason consonantiam resonarent, medii vero ad se invicem atque ad extremos diapente ac diatessaron, nichil vero in eis esset inconsonum, ad imitationem scilicet musicae mundanae, quae ex quattuor constat elementis.

> consonance. For just as there is a proper measure of pitch in the lower strings, so that the lowness does not descend all the way to silence, and likewise the proper measure of pitch in the higher strings is carefully maintained, so that the strings, when stretched too taut, not be broken by the tenuity of the pitch, but the whole is consistent and harmonious with itself: so too in the music of the world we discern that nothing is allowed to exist which would dissolve anything else by its excessiveness. For whatever exists, either brings forth its own fruits or assists others in bringing forth theirs. For what winter constrains, spring loosens, summer heats, and autumn ripens, and the seasons in turn either bring forth their own fruits or contribute to the fruitfulness of the other seasons.

The first thing to be noted is the predominantly visual, not auditory, orientation of Boethius' description of *musica mundana*: it is a harmony that is above all *perspicienda*, not *audienda*, in things which are seen (*uisuntur*) in the heavens, the elements, and the seasons. A similar emphasis on the visibility of cosmic harmony inaugurates the *Consolatio philosophiae*. Lady Philosophy, stressing a *quondam/nunc* antithesis in her initial assessment of 'Boethius,' frames her remarks in terms of the direction of the prisoner's gaze (*cernebat*, *uisebat*, *cernere*).[42] At *Cons. phil.* 1.m5, Boethius circles back again to the cosmic cycle of the heavens and the seasons, now in order to contrast the harmony of the heavens with the tyrannical disorder wrought by both *reges* and *fortuna*. As John Magee notes, however, Boethius' poetic evocation of the seasonal round[43] 'is beautifully expressed, [. . .] but it is not philosophical.'[44] The same could be said of the *descriptio caeli* that inaugurates the poem (*O stelliferi conditor orbis / qui perpetuo nixus solio / rapido caelum turbine uersas / legemque pati sidera cogis*, etc.).[45] It is enough for Boethius (at this point in the *Consolatio*, at least) to establish the simplicity and stability of divine governance in rhetorical terms, without any detailed appeal to the philosophical *ratio* which would necessarily underpin such a cosmology. The opening appeal to the *descriptio caeli et temporum* is but a setup for the prisoner's punchline: *O iam miseras respice terras / quisquis rerum foedera nectis! /* [. . .] */ Rapidos, rector, comprime fluctus / et quo caelum regis immersum / firma stabiles foedere terras*.[46] Cosmic order and tyrannical disorder are, on at least one

[42] *Cons. phil.* 1.m2.6–12, 24–27: Hic quondam caelo liber aperto / suetus in aetherios ire meatus / cernebat rosei lumina solis, uisebat gelidae sidera lunae / et quaecumque uagos stella recursus / exercet uarios flexa per orbes / comprensam numeris uictor habebat / [. . .] / nunc iacet effeto lumine mentis / et pressus grauibus colla catenis / decliuemque gerens pondere uultum / cogitur, heu, stolidam cerenere terram. Cf. Joachim Gruber, *Kommentar zu Boethius, De consolatione philosophiae*, 2nd ed., Texte und Kommentare 9 (Berlin and New York: Walter de Gruyter, 2006), 82–83, who marshals numerous parallels to *mersa profundo mens*, including *Inst. ar.* 1.1 (11.66): *oculum demersum*.

[43] *Cons. phil.* 1.m5.18–24: Tua uis uarium temperat annum, / ut quas Boreae spiritus aufert / reuehat mites Zehyrus frondes, / quaeque Arcturus semina uidit / Sirius altas urat segetes: / nihil anitqua lege solutum / linquit propriae stationis opus.

[44] Magee, "Boethius' Anapestic Dimeters," 155–156.

[45] *Cons. phil.* 1.m5.1–4.

[46] *Cons. phil.* 1.m5.42–48.

level, predominantly visual affairs.

David Chamberlain's influential article, 'Philosophy of Music in the *Consolatio* of Boethius,' synthesizes the various expressions of *musica mundana* in the *Consolatio*, concluding that, although it does not 'appear in the *Consolatio* by name,' it nevertheless 'permeates implicitly the imagery and thought of the work, and appears with the same major subdivisions as in the *De musica*, the musics [*sic*] of the stars, the elements, and the seasons.'[47] To suggest as Chamberlain does, however, that Boethius would have countenanced a fourth species of music, *diuina musica*, is to succumb to the self-perpetuating logic of scholastic *divisiones* and to miss, ultimately, the message of Boethius' philosophical reply to the initial visualization of cosmic harmony in divine governance and the seemingly erratic disharmony wrought by *fortuna* and tyrants.[48] Magee's study of the four acatalectic anapestic dimeters – 1.m5, 3.m2, 4.m6, and 5.m3, all of which chiastically circle (*inter alia*) the central themes of *musica mundana* (celestial, elemental, seasonal harmony)[49] – reveals 'Boethius' subtlest mode of poetic "argument."'[50] As Magee himself subtly argues, these *metra* gradually 'mend the rift,' break down the 'flawed dichotomy' between the celestial and terrestrial domains, and offer a means of 'making phenomenal particulars universal and intelligible, of coordinating them with the pattern.'[51] This pattern (variously: *series, modus, ordo*), which Chamberlain wants us to call *diuina musica*, already has a (Boethian) name, for in the discussion of *fatum et fortuna* in book four, Boethius explains how it is, in fact, Divine Providence, in its worldly, temporal guise as Fate, that maintains *both* the balance of the cosmic cycle (which amounts to a *musica mundana*) *and* the *actus fortunasque hominum*:[52]

[47] David Chamberlain, "Philosophy of Music in the *Consolatio* of Boethius," in *Boethius*, ed. Manfred Fuhrmann and Joachim Gruber, Wege der Forschung 483 (Darmstadt: Wissenschaftliche Buchgesellschaft, 1984), 386.

[48] ibid., 401–402: "Going even farther beyond *De musica*, Boethius also embodies in the *Consolatio* a fourth species of music, *divina musica*, that which exists in God, and by which He first creates and thereafter maintains world music. [. . .] If Boethius had written his musical treatise later in his career, after rather than before the tractates and *Consolatio*, he might well have added this fourth species of his classification." Cf. Gersh, *Concord in Discourse*, 43: "such observations [on the development or extension of Boethius' tripartite division] take a form scarcely concealing that indwelling tendency to systematic proliferation present from the very beginning."

[49] See, in particular, Magee's commentary on 1.m5 and 4.m6 in Magee, "Boethius' Anapestic Dimeters," 155–162.

[50] ibid., 168.

[51] ibid., 160, 167–168.

[52] *Cons. phil.* 4.p6.18–21: This chain [of fate] moves the heavens and the stars, proportionally mingles the elements with each other, transforms them in their alternating changes, and renews the cycle of generation and corruption through the similar progress of offspring and seeds. Moreover, it constrains the actions and fortunes of men by an insoluble connection of causes. Since this insoluble connection originates in unchangeable Providence, it is necessary that these causes be likewise unchangeable. For reality is best ruled when the simplicity that abides in the Divine Mind inaugurates an unvarying sequence of causes, but this sequence with its own immutability constrains mutable reality, which would otherwise randomly dissipate. So although all things may seem confused and perturbed to you, because you are entirely unable to grasp this sequence, all things nonetheless have their own pattern (*modus*), which orders and directs them toward the good.

> Ea series caelum ac sidera movet, elementa in se invicem temperat et alterna commutatione transformat, eadem nascentia occidentiaque omnia per similes fetum seminumque renovat progressus. Haec actus etiam fortunasque hominum indissolubili causarum connexione constringit; quae cum ab immobilis providentiae proficiscatur exordiis, ipsas quoque immutabiles esse necesse est. Ita enim res optime reguntur, si manens in divina mente simplicitas indeclinabilem causarum ordinem promat, hic vero ordo res mutabiles et alioquin temere fluituras propira incommutibilitate coerceat. Quo fit ut tametsi vobis, hunc ordinem minime considerare valentibus, confusa omnia perturbataque videantur, nihilo minus tamen suus modus ad bonum dirigens cuncta disponat.

Unchanging Divine Providence is thus the sole and single principle of changeable reality, both the cyclical patterning of the *musica mundana* and the eternal turn of the *rota Fortunae*.[53] In his early quadrivial works, Boethius had given another name to this *manens in divina mente simplicitas*: arithmetic. The priority of arithmetic is not merely propaedeutic; it is the very exemplar in the divine mind from which the world was brought into being: *hanc* [sc. *arithmeticam*] *ille huius mundanae molis conditor deus primam suae habuit ratiocinationis exemplar et ad hanc cuncta constituit, quaecunque fabricante ratione per numeros adsignati ordinis invenere concordiam.*[54] Thus the realization of the cosmic realm, the supremely ordered structure of the universe, proceeds from the (noetic) number that resides in the divine (or, perhaps, demiurgic) παράδειγμα.[55] A similar exemplarism, without the specification of arithmetic, characterizes the famous Timaean hymn that forms the cardinal point of the entire *Consolatio*: *tu cuncta superno / ducis ab exemplo, pulchrum pulcherrimus ipse / mundum mente gerens similique in imagine formans / perfectasque iubens perfectum absoluere partes.*[56] In this poetic epitome of the Platonic εἰκὼς λόγος or μῦθος (cf. *Tim.* 29b2–d3), Boethius elliptically compresses the Timaean *psychogonia* and its concordant implications: *Tu triplicis mediam naturae cuncta mouentem / conectens animam per consona membra resoluis / quae cum secta duos motum glomerauit in orbes, / in semet reditura meat mentemque profundam / circuit et simili conuertit imagine caelum.*[57] It is as much the placement as it is the content of these lines that underscores their importance within the *Consolatio* and Boethius' thought generally – as has often been remarked, they form the center-point of the central metrum of the entire *Consolatio*.[58] These innermost lines thus explode outward, both

[53] *Cons. phil.* 2.1.19: Tu uero uoluentis rotae impetum retinere conaris? At, omnium mortalium stolidissime, si manere incipit fors esse desistit.
[54] *Inst. ar.* 1.1 (12.76–79).
[55] Cf. *Intr. ar.* 1.6.1 (12.1–12).
[56] *Cons. phil.* 3.m9.6–9. On which, see Gruber, *Kommentar*, 279–280.
[57] *Cons. phil.* 3.m9.13–17. See Gruber, *Kommentar*, 281–282 for parallels with the *Timaeus* and Neoplatonic commentaries.
[58] ibid., 22–24, with the fold-out table between 20 and 21; Magee, "Boethius' Anapestic Dimeters," 151, with further literature cited in n. 15.

intra- and intertextually. At *Cons. phil.* 4.p6.13, Boethius goes so far as to suggest that the temporal realization of Fate, the unfolding of Divine Providence, may even be (or somehow be related to) the *anima mundi*, but the suggestion is made only in passing, as one in a long list of competing options that includes divine spirits, nature, the heavens, angels, and demons.[59]

The *anima mundi*, although nowhere explicitly invoked by Boethius in *De institutione musica* 1.2, is yet of central importance to the understanding of *musica mundana*,[60] and consequently, it will be a central concern in this chapter. Yet following the 'preposterous' order of the *Timaeus* (*hominibus mos est passim praepostereque et sine obseruatione ordinis fari*),[61] we will begin our discussion of the tripartite cosmic music not with soul but with body, the world's body, which is constituted from what was deemed in the twelfth century a *musica elementorum*. (The *temperies anni* is only discussed *passim*, as it was not a privileged theme in the twelfth century.) After laying out the principles of 'corporeal' harmony within the *mundanum corpus* (5.2), we will turn to the cosmic soul or *mundana anima*, as Macrobius deemed it (5.3–4). We will follow the developments and transformations in the various application of the world soul in twelfth-century commentaries and treatises, beginning with Bernard of Chartres and concluding with a discussion of an unpublished twelfth-century commentary on the Timaean *psychogonia*, a commentary which amounts to a twelfth-century *summa* on the subject. Fittingly, the chapter, and thus the study as a whole, concludes (*per aspera ad astra*) with a discussion of the *musica caelestis* (5.5). As we shall see, however, twelfth-century commentators began to move away from the sonorous 'reality' of the music of the spheres as a musico-astronomical concept, in sharp contrast to the extended discussions of the precise musical structures generated by the planetary motions such as we find in Carolingian commentaries.[62] Twelfth-century commentators

[59] *Cons. phil.* 4.p6.13: Siue igitur famulantibus quibusdam prouidentiae diuinis spiritibus fatum exercetur seu anima seu tota inseruiente natura seu caelestibus siderum motibus seu angelica uirtute seu daemonum uaria sollertia seu aliquibus horum seu omnibus fatalis series texitur. On which list, see Gruber, *Kommentar*, 349–350. Cf. *In Perih.* 2.231.11–232.10. Calcidius minimizes the relation between the *anima mundi* and *fatum*, arguing (*In Tim.* 144 [182.16–183.1]): At uero in substantia positum fatum mundi anima est tripertita in aplanem sphaeram inque eam, quae putatur erratica, et in sublunarem tertiam. On which, see Jan Den Boeft, *Calcidius on Fate: His Doctrine and Sources*, Philosophia antiqua 18 (Leiden: Brill, 1970), 9–13. Cf. Nemesius of Emesa, *Περὶ φύσεως ἀνθρώπου* 38: *Πλάτων δὲ διχῶς λέγει τὴν εἱμαρμένην· τὴν μέν, κατ᾽ αὐσίαν, τὴν δέ, κατ᾽ ἐνέργειαν. κατ᾽ οὐσίαν μέν, τὴν τοῦ παντὸς ψυχήν.* At *In Tim.* 147 (184.22–185.2) Calcidius returns to the same theme: Ipsae uero leges quae dictae sunt fatum est idque diuina lex est mundi animae insinuata, salubre rerum omnium. Sic fatum quidem ex prouidentia est nec tamen ex fato prouidentia. As Martijn points out (Martijn, *Proclus on Nature*, 34), Proclus rejects the identification of Fate and the world soul in his remarks on the *Myth of Er* (*In Remp.* 2.357.7–27).

[60] Cf. Heilmann, *Boethius' Musiktheorie und das Quadrivium*, 5.1.2 'Platons "Timaios" als Schlüssel zu den drei Musiken," 249–259.

[61] *Tim.* 34c, *translatio Calcidii* 27.3–4.

[62] On which, see Teeuwen, *Harmony and the Music of the Spheres: The ars musica in Ninth-Century Commentaries on Martianus Capella*.

were less concerned with the harmonic structures of the *musica caelestis* than with its symbolic, sometimes even metaphorical, employ as an epitome of (Platonic) celestial perfection and as a model for human ethics. Increasingly, writers stripped away the Platonic astronomical principles that underlay the mechanics of the celestial harmony and turned instead to a more Peripatetic view of the cosmos, which, it must be stressed, was adopted *before* the wide-spread availability of Aristotle's *De caelo*, with its famous rebuttal of the music of the spheres (*De caelo* 2.9). Twelfth-century commentators silenced the heavens independently of Aristotle, whose arguments were nevertheless destined to lend credence to a trend that was already underway. Thus the dichotomy between the musical heavens of the Platonists and the silent heavens of the Peripatetics is, to some degree, false. This study thus closes with a call to action: more research needs to be done on twelfth-century astronomy prior to and during the initial reception of the *De caelo*, as well as on the continued, if re-formulated, assertion of the *musica caelestis* after the availability of Aristotle's powerful challenge to the reality of celestial harmony.

5.2 *Musica elementorum*

πάντες γὰρ οἱ φυσικοὶ τὰ ἐναντία ποιοῦσιν ἀρχὰς καὶ ἐκ τῶν ἐναντίων ἁρμοσθέντων τὸν κόσμον ὑφιστᾶσιν ('Indeed, all the natural philosophers posit opposites as the starting points and establish the cosmos as arising from the harmonization of opposites.')[63] Such is Proclus' starting point for his discussion of the composition of the world's body, and the claim well characterizes the basic approach to what was deemed in the twelfth century the *musica elementorum*.[64] But before turning to twelfth-century accounts, we must first attend to the late-ancient conceptual framework for the theory of elemental qualities and their harmonious links. Most famously, Boethius evokes the harmonious balance of the elemental forces in the *Consolatio*'s great Timaean hymn, 3.m9: *Tu numeris elementa ligas, ut frigida flammis, / arida conveniant liquidis, ne purior ignis / euolet aut mersas deducant pondera terras*.[65] Although Boethius here employs the language of Aristotelian qualities (hot, cold, wet, and

[63] Proclus, *In Tim.* I 205.16–20. On which, Martijn comments: 'The sensible universe is characterized by a "war" of contraries, and one of the main results of the activities of the Demiurge is the establishing of a regular order between those contraries, keeping them at peace with each other' (Martijn, *Proclus on Nature*, 63).

[64] E.g., Bernard Silvestris, *Comm. in Mart.* 3.539.

[65] *Cons. phil.* 3.m9.10–12. Cf. 4.m6.19–24: Haec concordia temperat aequis / elementa modis, ut pugnantia / vicibus cedant humida sicis / iugantque fidem frigora flammis, / pendulus ignis surgat altum / terraeque graves pondere sidant. On the carefully constructed parallels between these passages (as noted above), see Magee, "Boethius' Anapestic Dimeters," 156–157 and 161–162. Cf. Martianus, *De nuptiis* 1.1 (1.7): namque elementa ligas uicibus.

dry), the primary target is in fact Plato's *Timaeus*, 31b–32c. As Magee has remarked, this blending of Aristotelian language within a summary of Platonic metaphysics ranks as 'Boethius' subtlest, and philosophically weakest, attempt to harmonize Plato and Aristotle.'[66] Proclus, as Magee notes, observed the futility of reconciling the two systems,[67] while both Calcidius and Macrobius forged a way to map Aristotelian doctrine onto the Platonic system.

At *Timaeus* 31b–32c, Plato describes the generation of the sensible world from the four elements, harmonized through proportional linkages. Fire and earth, located at opposite extremes, require two intermediary elements, air and water, to bring them into continuous proportion, the *ἀναλογία συνεχής* (the *ratio continui competentis* in Calcidius' language)[68] that ensures the continuity of the cosmic body.[69] Plato's explanation follows the rule of geometric proportions: two plane or square numbers (e.g., 4 and 9) require a single mean (6) to bring them into continuous proportionality (4:9:6), whereas two solid or cubic numbers (e.g., 8 and 27) require two means (12 and 18) to effect the same contiguity (8:12:18:27).[70] Such is the mathematical explanation that Boethius offers at *De institutione arithmetica* 2.46 as the key to the abstruse cosmology (*cosmopoeia*) of Plato's *Timeaus*.[71] In his *Commentarii*, Macrobius' brief exposition of the four elements draws primarily on the four Aristotelian qualities in order to create the same *iugabilis competentia*: earth (cold and dry) and water (cold and wet), although contrary in their dryness and wetness, are united in coldness; water and air, although contrary in their coldness and hotness, are united in wetness, etc.[72] Macrobius concludes

[66] Magee, "Boethius," 802.

[67] *In Tim.* 2.37.33–38.16. Magee, "Boethius," 802.

[68] *In Tim.* 18 (68.25), 21 (72.13), etc.

[69] *Tim.* 32b3–c4: *οὕτω δὴ πυρός τε καὶ γῆς ὕδωρ ἀέρα τε ὁ θεὸς ἐν μέσῳ θείς, καὶ πρὸς ἄλληλα καθ' ὅσον ἦν δυνατὸν ἀνὰ τὸν αὐτὸν λόγον ἀπεργασάμενος, ὅτιπερ πῦρ πρὸς ἀέρα, τοῦτο ἀέρα πρὸς ὕδωρ, καὶ ὅτι ἀὴρ πρὸς ὕδωρ, ὕδωρ πρὸς γῆν, συνέδησεν καὶ συνεστήσατο οὐρανὸν ὁρατὸν καὶ ἁπτόν. καὶ διὰ ταῦτα ἔκ τε δὴ τούτων τοιούτων καὶ τὸν ἀριθμὸν τεττάρων τὸ τοῦ κόσμον σῶμα ἐγεννήθη δι' ἀναλογίας ὁμολογῆσαν, φιλίαν τε ἔσχεν ἐκ τούτων, ὥστε εἰς ταὐτὸν αὑτῷ συνελθὸν ἄλυτον ὑπό του ἄλλου πλὴν ὑπὸ τοῦ συνδήσαντος γενέσθαι.*

[70] *Tim.* 32a7–b3: *εἰ μὲν οὖν ἐπίπεδον μέν, βάθος δὲ μηδὲν ἔχον ἔδει γίγνεσθαι τὸ τοῦ παντὸς σῶμα, μία μεσότης ἂν ἐξήρκει τά τε μεθ' αὑτῆς συνδεῖν καὶ ἑαυτήν, νῦν δὲ στερεοειδῆ γὰρ αὐτὸν προσῆκεν εἶναι, τὰ δὲ στερεὰ μία μὲν οὐδέποτε, δύο δὲ ἀεὶ μεσότητες συναρμόττουσιν.*

[71] *Inst. ar.* 2.46 (191.1–193.30): Post haec igitur tempus est, ut expediamus nunc quiddam nimis utile in Platonica quadam disputatione, quae in Timaei cosmopoeia haud facili cuiquam vel penetrabili ratione versatur. [...] Sint enim duo tetragoni IIII scilicet et VIIII. Horum igitur unus tantum medius in eadem proportione constitui potest. Namque senarius ad IIII sesqualter est et VIIII ad senarium eodem modo sesqualter. [...] Si autem cybi sunt, ut VIII et XXVII, duae tantum inter hos eadem proportione medietates constitui queunt, XII et XVIII [etc.]

[72] *In Som. Scip.* 1.6.25–26 (22.28–23.4): ita enim elementa inter se diversissima opifex tamen deus ordinis opportunitate conexuit, ut facile iungerentur. nam cum binae essent in singulis qualitates, talem uni cuique de duabus alteram dedit, ut in eo cui adhaereret cognatam sibi et similem reperiret. terra est sicca et frigida, aqua vero frigida et umecta est. haec duo elementa, licet sibi per siccum umectumque contraria sint, per frigidum tamen commune iunguntur. Cf. *Prem. phys.* 5.8: Sed quia contraria inuicem conuenire non possunt sine aliquo uinculo medio ordinato connectente ea, ordinauit creator infra terram et aerem contraria existentia aquam, dans ei duas qualitates, frigiditatem et humiditatem, per quas

that the bonds of the four elements are unbreakable, as two extremes are held together by two means.[73] Just as Boethius does in his *Consolatio*, Macrobius uses Aristotelian (qualitative) elemental theory to target the Platonic (quantitative) elemental bonds, though he alludes also to a second set of four qualities that could effect the same bond: *densitas*, *pondus*, *levitas*, and *raritas*.[74]

Calcidius' *Commentary* (21–22) expands upon this latter gesture by Macrobius and presents a much richer theory that attempts to 'mathematicalize' the elemental series, as has been well discussed by Stephen Gersh.[75] Calcidius carefully distinguishes, as Gersh has noted, two separate problems within Plato's account: 'first, what is the precise nature of the mathematical series?; and secondly, with what physical properties do the mathematical values correlate?'[76] In answer to the first question, Calcidius proves, as did Boethius, that the proportionality in question is the *analogia, id est ratio contintui competentis*.[77] In answer to the second question, Calcidius equates the mathematical *analogia* with the six elemental qualities that are briefly mentioned in a later passage of the *Timaeus* (55d8ff., beyond where Calcidius' translation stops),[78] though he does allude to the possibility of other correlations,[79] including the four Aristotelian qualities and their cyclical interchange in the process of *generatio et corruptio*.[80] Fire is *subtilis*, *mobilis*, and *acutus*, but earth is diametrically opposed in being *corpulenta*, *immobilis*, and *obtunsa*.[81] Thus the proportional transformation from one

posset extremis coniuncta ea conectere. Per frigiditatem namque concorat terrae, humiditate autem coniungitur aeri.

[73] *In Som. Scip.* 1.6.26 (23.14–21): haec tamen varietas vinculorum, si elementa duo forent, nihil inter ipsa firmitatis habuisset; si tria, minus quidem valido aliquo tamen nexu vincienda nodaret, inter quattuor vero insolubilis conligatio est cum duae summitates duabus interiectionibus vinciuntur, quod erit manifestius si in medio posuerimus ipsam continentiam sensus de Timaeo Platonis excerptam.

[74] *In Som. Scip.* 1.6.32 (24.4–7): nam quantum interest inter aquam et aerem causa densitatis et ponderis, tantundem inter aerem et ignem est; et rursus quod interest inter aerem et aquam causa levitatis et raritatis, hoc interest inter aquam et terram, [etc.]

[75] Gersh, *Concord in Discourse*, 128–138.

[76] ibid., 130.

[77] On the general theme of *analogia* in Calcidius, see Anna Somfai, "Calcidius' *Commentary* on Plato's *Timaeus* and Its Place in the Commentary Tradition: The Concept of *Analogia* in Text and Diagrams," in *Philosophy, Science and Exegesis in Greek, Arabic and Latin Commentaries*, 2 vols., Bulletin of the Institute of Classical Studies 83 (London: Institute of Classical Studies, University of London, 2004), 203–220.

[78] On which, see Waszink, *Timaeus a Calcidio translatus*, lxv–lxiv.

[79] As noted by Gersh, *Concord in Discourse*, 132. *In Tim.* 14 (66.8–11): siquidem in illo igni plus est claritudinis, aliquanto minus moderati caloris, exiguum uero soliditatis, in terrae autem globo plus sit soliditatis, aliquantum uero humoris, perexiguum lucis, aeris et aquae duae medietates quam habeant cognationem cum supra memoratis elementis intellegamus.

[80] *In Tim.* 317–318 (313.7–314.16): Etenim terra duas habet proprias qualitates, frigus et siccitatem [...]. Similiter aqua in duabus qualitatibus inuenitur, humoris uidelicet et frigoris, et est propria qualitas terrae quidem siccitas, aquae uero humor, communis uero utriusque natura frigoris. Cum igitur terra late fusa conuertetur aliquatenus in aquam, tunc siccitas quidem eius mutata erit in humorem, etc.

[81] *In Tim.* 21 (72.7–17): ignis quidem acumen, quod est acutus et penetrans, deinde quod est tener et delicata quadam subtilitate, tum quod est mobilis et semper in motus, terrae vero ⟨obtunsitas⟩, quod est retunsa, quod corpulenta, quod sember immobilis. Hae vero naturae licet sint contrariae, habent hamen aliquam ex ipsa contarietate parilitatem – tam

extreme to the other is effected by changing one quality at a time, much like the classic word-morph game that changes CAT into DOG by changing one letter at a time.

In the twelfth century, the Aristotelian language of Macrobius and the Platonic language of Calcidius were united in an attempt to explain Plato's reference to single and double means within the elemental harmony, and a remarkably consistent theory coalesced around the (already existing) theory of elemental *sinzugiae*.[82] Although the original usage of the elemental *sinzugiae* employed only the four Aristotelian qualities, twelfth-century commentators were quick to roll Calcidius' 'Platonic' qualities into the theory. Thus the elemental syzygies were expanded to encompass two *sinzugiae*: a *plana sinzugia* formulated through the double Aristotelian qualities, and a *cubica sinzugia* formulated through the triple Calcidian qualities. Irene Caiazzo has usefully traced the development of this theory in the thought of William of Conches:[83] the double *sinzugiae* appear already in William's earliest work, the *Glosae super Boethius*, though he only explains the *plana sinzugia* and nowhere mentions the Calcidian qualities.[84] Similarly, the *Glosae super Macrobium* alludes to double and triple qualities but does not specify them.[85] The first definitive employ of the Calcidian elemental qualities occurs

enim similia similibus quam dissimilia dissimilibus comparantur – et haec est analogia, id est ratio continui competentis: quod est est acumen adversum obtunsitatem, hoc subtilitas iuxta corpulentiam, et quod subtilitatis iuxta corpulentiam, hoc mobilitas adversus immobilitatem; et si verteris, ut id quod medium est extimum fiat, quae vero sunt extima singillatim in medo locentur, servabitur analogiae norma. Cf. the same system, articulated through a synonymous yet different set of Latin terms, in *Prem. phys.* 5.29: Dicit [sc. Plato] quoque per alium modum diuidens unumquodque elementum tres qualitates habere, ignem quidem acumen, raritatem, motum; alterum uero extremum elementorum, hoc est terram, harum contrarias qualitates habere, hebetudinem, densitatem, stationem, ut sint secundum has qualitates contraria terra et ignis, quod non esset secundum alias qualitates in coniugatione existentes. Accipi autem ab utrisque extremis qualitates et sic media elementa facta esse. Accipiuntter enim ab igne duae qualitates, raritas et motus, et una a terra hebitudo, et constituitur aer specificas habens qualitates, hebitudinem, raritatem, motum [. . .]. Ut igitur est ignis ad aerem, sic est aer ad aquam, et ut aer ad aquam, sic aqua ad terram.

[82] As pointed out by Irene Caiazzo, the term, employed to describe the links between the elements, is found in a commentary on Boethius' *Consolatio* attributed to Remigius of Auxerre (Edmund Taite Silk, ed., *Saeculi noni auctoris in Boetii Consolationem philosophiae commentarius*, Papers and Monographs of the American Academy in Rome 9 [Rome: American Academy in Rome, 1935], 334–335): Nam quatuor sunt elementa quorum sex sunt coniunctiones quas Graeci sinzugias vocant. Quarum quatuor sunt inmediatae et duae mediatae. It is also employed by Eriugena in his translation of Gregory of Nyssa's *De opificio hominis* (*De imag.* 257.28). See Irene Caiazzo, "The Four Elements in the Work of William of Conches," in *Guillaume de Conches: philosophie et science au XIIe siècle*, Micrologus Library 42 (Florence: SISMEL edizioni del Galluzzo, forthcoming), 3–66. On the theory of the elemental syzygies generally, see Peter Vossen, "Über die Elementen-Syzygien," in *Liber floridus: Mittellateinische Studien: Paul Lehmann zum 65. Geburtstag am 13. Juli 1949*, ed. Bernhard Bischoff and Suso Brechter (St Ottilien: Eos Verlag der Erzabtei, 1950), 33–46.

[83] Caiazzo, "The Four Elements in the Work of William of Conches."

[84] *Glos. sup. Boet.* 3.m9.475–479: Quod ut apertius sit, dicatur primo de illa coniunctione quae fit uno medio, quae dicitur plana sinzugia, id est plana coniunctio; postea de illa quae fit duobus mediis, quae est cubica sinzugia, id est solida coniunctio.

[85] *Glos. sup. Macr.*, comment. ad 1.6.24: Quare si habeant duas qualitates sese dissoluentes, ut terra et aer, indigent uno solo medio, ut aqua quae est medium inter illa. Item si habeant tres qualitates agentes, indigent duobus mediis, ut terra et ignis. In coniunctione ergo unius medii ternarius habet magnam potentiam, quia ad minus oportet illa esse tria, unum medium et duo extrema. In coniunctione contrariorum duobus mediis interpositis quattuor obtinet uim uinculorum, quia ad minus oportet illa esse quattuor, duo scilicet media et duo extrema, quare id quod est partium attribuitur toto.

in William's *Philosophia*,[86] and thereafter the double elemental links remained one of the few stable points in his ever changing position on the elements.

The theory of the elemental syzygies enjoyed a wide circulation in twelfth-century commentaries on Boethius, Macrobius, and Plato,[87] and the the theory (though without the term *sinzugia*) is employed in the St. Florian commentary on the *De institutione musica* to explain Boethius' harmony of the elements. 'Although the elements appear contrary,' the St. Florian commentator writes, 'some (*quidam*) join them together in musical harmony, just as contrary voices create one musical consonance.'[88] This harmony, he explains, takes two forms: 'sometimes according to binary qualities, sometimes according to ternary qualities,' and there follows a cogent summary of the Macrobian and Calcidian positions.[89] But then, as a quick aside, he engages in brief speculation as to what these elements are. He notes the position that the elements (as some assert) are the qualities that naturally inhere in the elements, but he maintains in response that elements, because they are constitutive of bodies, must themselves be bodies.[90] The commentator's brief remarks on the ontological status of the elements aligns well with William of Conches' early (pre-*Philosophia*) standpoint on the elements,

[86] *Phil.* 1.21 (51BC): Idcirco iecit deus quasi fundamenta ignem et terram. Sed quoniam in eis sunt contrarietates – quippe terra est corpulenta, obtusa, immobilis, ignis acutus, subtilis, mobilis – videt deus sine medio ea iungi non posse et ideo inter ea medium creavit. On the *coniunctio elementorum*, see *Phil.* 1.21 (51C–52D). Cf. *Guillelmi Glos. sup. Tim.* 63.1–39; *Drag.* 2.5.1.

[87] *Comm. in Mart.* 3.44off.: Cum sit, ut sepe dictum est, musica mundana tripartita, duos illos primos versus, scilicet SEMINA, ETC., quos generaliter de tota mundana exposuimus, specialiter possumus de elementis legere [...] COMPLEXV ETC. Hic notandum est geminam esse et in numeris et in molibus sinzugiam. [...] Atque hec est sinzugia, id est superficialis coniunctio. Hec in elementis alternis consideratur. Cum enim ignis calidus et siccus, aqua frigida et humida, aer medius calidum habet ab igne, humidum ab aqua. [...] Solidorum vero sinzugia duo media querit. [...] Hec quoque solidorum sinzugia in elementis invenitur. Remotissima enim sunt et ignis et terra; et ille quidem subtilis, acutus, mobilis; illa corpulenta, obtusa, immobilis. Ut ergo in numeris uidisti, ita in his attende. Anon., *Commentum in 'O qui perpetua mundum'*, Vat. lat. 919, 199v–200r: LIGAS ELEMENTA NVMERIS [...] Sed sciendum quod in istis alia est plana zinzugia (id est iunctura), alia est solida zinzugia. [...] Ad coniungendum illos duos [*sc.* quaternarium et nouenarium] sufficit senarius. Sic ad caliditatem et siccitatem ignis coniungendam cum frigiditate [frigido *ante corr. cod.*] et humiditate aquae sufficit una ligatura, aer uidelicet, qui caliditate ignis caliditati coniungatur, humiditate humiditati aquae coniungatur. Iterum ad coniugendum terram et aquam sufficit frigiditas. [...] Solida uero zinzugia in numeris colligatur duobus mediis. [...] Ad similitudinem horum fit in elementis solida zinzugia, quia, cum tres sint proprietates principales in quolibet elemento (et ignis sit leuis, acutus ⟨et⟩ mobilis; terra uero corpulentia, obtusa et immobilis), quo modo possent uno elemento colligari. On the latter text, see Bernhard Pabst, *Atomtheorien des lateinischen Mittelalters* (Darmstadt: Wissenschaftliche Buchgesellschaft, 1994), 195–202.

[88] *In inst. mus.* 35: Elementa enim licet contraria esse uideantur, quidam tamen musica armonia coniungunt, sicut contrarie voces unam faciunt musicam consonantiam.

[89] *In inst. mus.* 35: Sed assignatur quandoque contrarietas secundum binas qualitates, quandoque secundum ternas. Quae vero binis repugnant qualitatibus, uno medio iunguntur ad similitudinem tetragonorum, ut ignis et aqua binis repugnant qualitatibus, quia ignis est calidus et siccus, aqua vero frigida et humida, et ligantur uno solo medio interposito s. aere [...]. Assignatur etiam quandoque contrarietas ternis qualitatibus, et tunc opportet illam duobus mediis conligari, ut ignis et terra, nam ignis est subtilis, acutus, et mobilis, terra gravis, obtusa et immobilis, ideo duobus mediis conligantur ad similitudinem cuborum.

[90] *In inst. mus.* 35: CONTRARIAS EORVM POTENTIAS, i. contrarias proprietates naturaliter eis adherentes s. frigiditatem, humiditatem, caliditatem, siccitatem, quas quidam esse elementa asserunt, sed cum elementa partes sint corporum, corporis autem nihil est pars nisi corpus, constat quod melius dicuntur ipsa corpora elementa.

as articulated in his first work, the *Glosae super Boetium*. William too refutes those who say that the properties of elements are themselves the true elements, and after dismissing a few other erroneous positions, he concludes that the elements are simply what we see as separable in the sensible world: earth, water, air, and fire.[91]

5.3 *Anima mundi et harmonia*: the late-ancient reception

We begin with Calcidius' conclusions. Soul is an incorporeal, self-moving, rational substance,[92] and it is 'modulated, set in motion, and has an affinity to number.'[93] These definitions ostensibly pertain to the human soul, but they apply equally to the world soul, for as Calcidius concludes in his early chapters on the *anima mundi*, his discussion of music theory (in chapters 40–50) has made it sufficiently clear 'how the nature of the world soul is analogous (*conuenire*) to number and measure.'[94] Likewise, chapter 102 proves that the world soul is an incorporeal, rational substance,[95] while chapter 56, in an argument buttressed by chapter 57's long quotation from Plato's *Phaedrus*, reveals that it is self-moving.[96] Finally, in defense of Plato and against those who would accuse him of a gross inconsistency (the *Phaedrus*, runs the critique, proposes a simple soul but the *Timaeus* a seemingly composite soul), Calcidius replies that the Timaean 'composite' soul is not *really* composite, but it does have a *ratio compositionis*, 'akin to a musical concord (*symphonia*), such as the diatessaron.'[97] The lines connecting the *anima mundi* to the *anima humana* are clearly visible, and as Gretchen Reydams-Schils has highlighted, Calcidius 'read[s] the rapport between the World Soul and the human soul as a very close one' and he 'minimize[s] the ontological differences between the two.'[98]

[91] *Glos. sup. Boet.* 3.m9.375–391: Et dicunt alii proprietates elementorum esse elementa, et ita constare omnia ex quatuor elementis, id est ex quatuor proprietatibus. [. . .] Sed nec istud nec illud michi placet. Immo placet michi elementa esse quae videntur a nobis separata, scilicet terra et aqua et cetera.

[92] *In Tim.* 226 (241.8–9): Est igitur anima iuxta Platonem substantia carens corpore semet ipsam mouens rationablis.

[93] *In Tim.* 226 (242.6–7): Deinde anima, sicut in superioribus constitit, modulata est positaque in motu suo habetque cum numeris cognationem. Cf. 102 (152.22): Porro quod eandem [sc. animam] modulatam esse asserit.

[94] *In Tim.* 51 (100.3–5): Nunc quoniam ex quibus constet anima mundi uirtutibus, uelut ex partibus membrisque coagmentata isdem uirtutibus, et quem ad modum natura eius numeris modisque conueniat palam factum est [. . .].

[95] *In Tim.* 102 (152.14–22): nunc tamen animam docet esse incorpoream [. . .]. Rationis tamen compos, ut declaret naturam rationabiliem carentem corpore, quae quidem est animae rationabilis propria et conueniens adumbratio.

[96] *In Tim.* 56–57 (104.2–3, 18–19): Quod autem ex semet ipsa moueatur anima, declarat idem, cum differentiam faciens opinionum et scientiae dicit haec: [*Tim.* 37a2–c5]. Hoc idem aliquanto apertius significat in Phaedro dicens ita: [*Phaedr.* 245c5–246a2].

[97] *In Tim.* 228 (243.18–244.2): nescientes compositum id esse quod ex aliquo initio temporis factum sit, ut nauim et domum, quiddam uero, quod compositium quidem non sit, habeat tamen rationem compositionis, ut in musica symphonia, quae diatessaron uocatur.

[98] Reydams-Schils, "Calcidius on the Human and World Soul," 195.

As we saw at the beginning of chapter four, however, Calcidius' discussion of the human soul glosses over any detailed consideration of the connection between soul and number or soul and (musical) harmony. The same is true for his discussion of the world soul. Despite language that, at times, seems to imply a harmonic 'structure' within the world soul – e.g., describing it as *diuisa [. . .] numeris, composita analogiis, stipata medietatibus, ordinata rationibus musicis*[99] – Calcidius nowhere goes so far as to call any soul, world or human, number or harmony. Instead, in the words again of Reydams-Schils, he 'couches his analysis systematically in terms of a kinship or a matching; the structure of the soul reflects certain relationships among numbers.'[100] The implications of these numerical relations, in Calcidius' view, pertain more to the points of connection between the psychic and the corporeal than they do to any explicitly harmonic or musical result. For instance, the Adrastan diagrammatic approach to the division of the world soul is first adduced as proof of the *ratio* that underlies the *animae corporisque coniugium*: 'Because soul was designed to penetrate both surfaces and solids with its vital vigor, it was necessary that it possess powers akin to the solid and the surface, insofar as like flocks with like.'[101] Thus Calcidius envisages the division as the numerical representation of the procession from the point to the solid, enacted through double procession from both even (2 4 8) and odd (3 9 27) numbers. Later in the commentary, Calcidius summarizes his view on the division process, again highlighting the correlation of the psychic and the corporeal, and in the process (as Stephen Gersh has pointed out), Calcidius connects arithmetical and harmonic means within the world soul to the numerical bonds between the elements (as discussed above):[102]

> Horum numerorum interualla numeris aliis contexi uolebat, ut esset in animae textu corporis similitudo. Itaque limitibus constitutis, uno sex, altero duodecim qui est duplex, duabus medietatibus, octo et nouem sex et duodecim limitium interuallum continuauit epitrita, item sescuplari potentia, perindeque ut inter ignis limitem terraeque alterum limitem insertis aeris et aquae materiis mundi corpus continuatum est ita numerorum potentiis

[99] *In Tim.* 102 (153.3–4).

[100] Reydams-Schils, "Calcidius on the Human and World Soul," 193.

[101] *In Tim.* 33 (82.9–15): Ista ergo descriptio quae partium ex quibus anima constare dicitur genituram seu coagmentationem deliniat, ostendit rationem animae corporisque coniugii. Quippe corpus animalium, quod inspiratur animae vigore, habet certe superficiem habet etiam soliditatem. Quae igitur cum vitali vigore penetratura erat tam superficiem quam soliditatem, similes soliditati, similes etiam superficiei vires habere debuit, siquidem paria paribus congregantur.

[102] *In Tim.* 92 (144.19–145.4): He wanted the intervals of these numbers to be interwoven with other numbers, so that there might be a likeness of body woven within the soul. Thus, when he had established the limits at six and twelve (the duple of six) and the two means at eight and nine, the power of the epitritic and hemiolic united the interval between the limits six and twelve, in the same manner as the world's body has been united by inserting the substances of air and water between the limits constituted by fire and earth. These numerical potencies have been inserted such that intelligible parts of soul are joined as if by elements and substances, and that there is a kind of likeness that obtains between soul and body.

> insertis, ⟨ut⟩ tamquam elementis materiisque membra animae intellegibilia conecterentur essetque aliqua inter animam corporumque similititudo.

As Gersh argues, the presence of numerical relations in both the division of the soul and the conjunction of the elements allows Calcidius to posit another connection between psychic substance and worldly corporeality: 'Thus, the original parts of psychic substance correlate with point, line, surface and solid in the sphere of physical bodies while – thanks to the doctrine of harmonic and arithmetical means – the original and supplementary parts of psychic substance correlate with extreme and intermediate elements in that sphere of physical bodies.'[103] The harmony within the (world) soul thus comports with the harmony within the (world's) body, and the similitude (as Calcidius stresses elsewhere) accounts for the ability of the soul both to penetrate bodies and to have knowledge of both the intelligible and the sensible world.[104] The only perceptible manifestation of the harmony within the world soul is the *musica caelestis*, which (as noted at the beginning of this chapter) is a direct consequence of the former's numerical 'structure':[105]

> Huic ergo adumbrationi, qua depinxit animam, imaginem similitudinis aemulae speciemque mundi deliniat septemque circulos instituit planetum eosdemque aduersum se distare facit interuallis musicis, ut iuxta Pythagoram motu harmonico stellae rotatae musicos in uertigine modos edant, similiter ut in Politia Sirenas singulis insistere circulis dicens, quas rotatas cum circulis unam ciere mellifluam cantilenam atque ex imparibus octo sonis unum concordem concentum excitari.

This celestial harmony, moreover, allows Calcidius to forge yet another parallel between the world soul and human souls. Although the world soul does not have the irrational psychic aspects (*iracundia* and *cupiditas*) that are present in the less pure human souls, it nonetheless has a certain corollary to them in the celestial harmony produced by the world soul. The *aplanes* is akin to

[103] Gersh, *Concord in Discourse*, 137.

[104] *In Tim.* 51 (100.8–11): Uult igitur anima sensibilis mundi tamquam permissa usurpandi licentia nasci, cognitricem tamen rerum omnium, quae sunt tam intellegibiles quam sensiles. Est porro Pythagoricum dogma similia non nisi a similibus suis comprehendi. 53 (102.4–8): Qua ratione concluditur animam ex duplici concretam substantia geminaque natura numerorum potentiae concinentem uiuificantemque caelestia corpora animaliaque, in quibus sit ratio et disciplina, habere omnium rerum conscientiam ex quarum potentiis ipsa constet.

[105] *In Tim.* 95 (148.2–11): [Plato] delineated the form of the world as an image with a likeness comparable to the sketch that he employed to depict the world soul; he established seven circles and separated them by musical intervals, so that, in accord with Pythagoras, as the stars rotate with a harmonic motion, they might produce musical modes in their rotation. Plato says something similar in his Republic, namely that a Siren resides in each individual sphere, and each Siren spins with its sphere, each produces a single mellifluous song. From these eight unequal sounds a single, concordant harmony arises.

ratio, and the *planetes* are likened to (*ut*) *iracundia* and *cupiditas*; the harmony of these maintains the *modificata uita* of the entire universe.[106]

In contrast to Calcidius, Macrobius is more inclined to accept the numerical and musical structure of the soul in a more literal manner (as we have already seen in chapters one and four).[107] The world soul is, in a favored Macrobian phrase, 'woven from numbers' (*contexta numeris*);[108] it originated from *musica* and thus confers a musical structure upon everything that it animates, both celestial bodies and animate bodies that move in and upon the earth, air, and water.[109] Thus the *anima mundi*, in its role as the source of harmoniously regulated *uita*, becomes the crucial link in the Homeric *catena aurea*: *a summo deo usque ad ultimam rerum faecem una mutuis se vinculis religans et nusquam interrupta conexio*.[110]

5.4 *Anima mundi et harmonia*: the twelfth century

The twelfth century produced a remarkable diversity of views on the *anima mundi*. Nonetheless, a complete discussion of its philosophical, cosmological, mythological, and theological applications within the fabric of the universe and its connections to the divine nature (as, most famously, an image of the *spiritus sanctus*) is not possible here.[111] The scope this discussion focuses solely upon the harmonic and musical implications of the world soul in the twelfth-century commentary tradition.

For Bernard of Chartres, the *anima mundi* is a *uitalis motus temperandarum rerum*, which is diffused equally through all parts of the world, but because it found some bodies more suited to its

[106] *In Tim.* 95 (148.9–11): Erit ergo animae aplanes ratio, planetes ut iracundia et cupiditas ceterique huius modi motus quorum concentu fit totius mundi uita modificata. Cf. 144 (182.16–183.1): tripertita [sc. anima mundi] in aplanem sphaeram inque eam quae putatur erratica et in sublunarem tertiam.

[107] See 1.7 and 4.4.

[108] *In Som. Scip.* 2.2.1 (99.22–24): in Timaeo suo mundi animam per istorum numerorum contextionem ineffabili providentia dei fabricatoris instituit. 2.2.14 (101.19–22): Timaeus igitur Platonis in fabricanda mundi anima consilium divinitatis eununtians ait illam per hos numeros fuisse contextam. 2.2.19 (102.30–103.2): ergo mundi anima, quae ad motum hoc quod videmus universitatis corpus impellit, contexta numeris musicam de se creantibus concinentiam. Cf. 1.6.43 (26.4–6): item nullus sapientum animam ex symphoniis quoque musicis contstitisse dubitavit.

[109] *In Som. Scip.* 2.3.11 (106.1–9): inesse enim mundanae animae causas musicae quibus est intexta praediximus, ipsa autem mundi anima viventibus omnibus vitam ministrat. [. . .] Iure igitur musica capitur omne quod vivit, quia caelestis anima, qua animatur universitas, originem sumpsit ex musica. haec dum ad sphaeralem motum mundi corpus impellit, sonum efficit.

[110] *In Som. Scip.* 1.14.14–15 (57.25–58.13).

[111] See Gregory, *Anima mundi. La filosofia di Guglielmo di Conches e la scuola di Chartres*, esp. 123–174. For more recent approaches to the subject, see Irene Caiazzo, "Le discussione sull'Anima mundi nel secolo xii," *Studi filosofici* 16 (1993): 26–62; Irene Caiazzo, "L'âme du monde: un thème privilégié des auteurs chartrains au XIIe siècle," in *Le temps de Fulbert. Actes de l'Université d'été du 8 au 10 juillet 1996* (Chartres: Société archéologique d'Eure-et-Loire, 1996), 79–89; Frank Bezner, *Vela Veritatis: Hermeneutik, Wissen und Sprache in der Intellectual History des 12. Jahrhunderts*, Studien und Texte zur Geistesgeschichte des Mittelalters 85 (Leiden: Brill, 2005), esp. 107–124, 324–337.

nature than others, it exercises its power more in some bodies and less in others, as exemplified in the Vergilian line: *quantum non noxia corpora tardant* (*Aeneid* 6.731).[112] As we will see, this line of interpretation is taken up by nearly all of the twelfth-century commentators, though it is pushed farther than Bernard does here. Bernard does not specify what sort of *uis* the *anima mundi* confers upon worldly bodies. Bernard in general is more interested in the components of the world soul, and his comments on the psychic substance provide a complex doxography interweaving (at least five) differing opinions on the identity of the divisible and indivisible substance, the same and different nature. About the division of the world soul, in contrast, Bernard has comparatively little to say, and his remarks are more concerned with numeric symbolism than with the harmonic calculations. The seven limits, for instance, indicate (as in Calcidius and Macrobius) a psychic purity comparable to Minerva, who neither is generated nor generates.[113] The six intervals (*intervalla*) amidst the seven terms indicate the perfection of the soul, as six is a perfect number.[114] Bernard only briefly remarks on the musical aspect of the world soul: *Item inter septem partes omnes musicae consonantiae considerantur, per quod armonia animae naturaliter insita denotatur*.[115] He clearly knew that he was dealing with the ratios of musical consonances but thought it unnecessary to deal with them in detail. For instance, Plato's mention of the *leimma* in the division of the soul prompts Bernard to note only that 'two continuous epogdoic ratios do not complete an epitritic ratio without the addition of the minor semitone.'[116] Quibbles about his mixing mathematical ratios with the interval of a minor semitone notwithstanding, Bernard is correct. Why this is the case and how it could be mathematically proven, however, is not Bernard's concern.

[112] *Bernardi Glos. sup. Tim.* 5.1–8: et ANIMAM IN MEDIETATE EIVS LOCAVIT, id est uitalem motum temperandarum rerum. Non quod per medium hic accipias terram uel solem, qui secundum quosdam cor mundi et medius planetarum dicitur, sed ideo dicit animam in medio locatam, ut per hoc innuat animam per omnes partes mundi diffusam aequaliter. Sed quia quaedam corpora magis idonea suae naturae inueniebat, quaedam minus, in eis magis uel minus uim suam exercet. Vnde Virgilius: 'quantum non noxia corpora tardant.' Cf. Macrobius *In Som. Scip.* 1.14.14 (57.33–58.15): utque adsereret eundem esse in anima semper vigorem, sed usum eius hebescere in animalibus corporis densitate, adiecit, *quantum non noxia corpora tardant* et reliqua. Cf. *Guillelmi Glos. sup. Tim.* 71.11 cum nota.

[113] *Bernardi Glos. sup. Tim.* 5.136–139: Puritas etiam animae per septenarium habetur, quia septenarius a ueteribus dictus est Minuera, quia sicut illa sine matre et prole est, ita septenarius infra denarium nec gignit nec gignitur. Cf. Calcidius, *In Tim.* 36 (85.14–18) (cum notis); Macrobius, *In Som. Scip.* 1.6.11 (20.15–22).

[114] *Bernardi Glos. sup. Tim.* 5.140–141: Item per sex interualla septem limitum perfectio animae notatur, quia senarius perfectus est. Cf. Calcidius, *In Tim.* 38 (87.15–16); Macrobius, *In Som. Scip.* 1.6.12 (20.22–28).

[115] *Bernardi Glos. sup. Tim.* 5.141–143. The continuation of this passage has been discussed in chapter two (see 2.5 [p. 65]). Cf. his comment on the opening line of the *Timaeus* (3.34–39): Si uero Socratem cum tribus consideres, quattuor sunt, in quo numero omnes musicas consonantias uel proportiones inuenies. Duo enim ad unum duplus est, scilicet diapason; tres ad duo sesquialter, id est diapente; quattuor ad tres sesquitercius, id est diatessaron; ad unum idem quattuor quadruplus, id est bis diapason. Quibus simphoniis mundi fabricam constructam esse docebit. Non sine causa ergo quartus auditor subtractus est.

[116] *Bernardi Glos. sup. Tim.* 5.175–176: duo epogdoi continuati non perficiunt epitritum sine additione minoris semitonii.

William of Conches, in contrast, is more interested in the cosmological and harmonic implications of the world soul than he is with its philosophical role. The world soul, in William's influential formulation, is a *spiritus quidam rebus insitus, motum et uitam illis conferens*.[117] It thus has a kinship to nature, which (according to William) is likewise a *uis rebus insita*, but nature has a further generative force that the world soul seems to lack, namely the power of *similia de similibus operans*.[118] In his earliest known commentary, the *Glosae super Boetium*, William boldly identifies the *anima mundi* with the *spiritus sanctus*:[119]

> Anima mundi est naturalis uigor quo quaedam res tantum habent moueri, quaedam crescere, quaedam sentire, quaedam discernere. Sed quid sit ille uigor naturalis quaeritur. Sed ut michi uidetur ille naturalis uigor est spiritus sanctus, id est diuina et benigna concordia, quia diuino amore et concordia habent omnia esse, moueri, uiuere, crescere, sentire, discernere.

In his later commentaries, however, including the *Glosae super Macrobium*, which seem to have been composed only shortly after the Boethius glosses, William qualifies this identification: the Macrobius glosses attribute the view to the anonymous *quidam*: *Ergo subiungit de anima mundi, quae secundum quosdam est spiritus sanctus ex utroque procedens, qui omnia in mundo mouet et uiuificat*. But as if (quietly) vouching for the orthodoxy of the view, William immediately supports the *quidam* by appealing to scripture (Sap. 1.7): *Spiritus enim Domini repleuit orbem terrarum*.[120] In his glosses on Plato, William appeals to the same *quidam*, but omits the biblical reference and takes an explicitly non-committal stance: *Hunc spiritum dicunt quidam esse Spiritum Sanctum, quod nec negamus modo, nec affirmamus.*[121] Finally, in his last work, the *Dragmaticon*, the *anima mundi* has disappeared entirely. Thus we should be careful of attributing a single doctrine of the *anima mundi* to William of Conches; clearly William's view on the issue changed over time – and the change is not limited to the identification of the *anima mundi* and *spiritus sanctus*, which has dominated the modern literature on the subject. William of St. Thierry, in his letter to Bernard of Clairvaux, *De erroribus Guillelmi de Conchis*, says nothing about William's position on the world soul as Holy Spirit, perhaps because

[117] *Guillelmi Glos. sup. Tim.* 71.8–9. For a concise comparison of William's definition(s) of the world soul with other twelfth-century sources, see Caiazzo, "Le discussione sull'Anima mundi nel secolo xii," 59–61.

[118] *Guillelmi Glos. sup. Tim.* 37.8–9.

[119] *Glos. sup. Boet.* 3.metr9.522–528: The world soul is that natural vigor through which some things have the capacity to move, some to grow, some to perceive, and some to [rationally] discern. But it is asked what precisely is this natural vigor. As it seems to me, it is the Holy Spirit, i.e., the divine and good concord, because from this divine love and concord all things have the capacity to exist, move, live, grow, perceive, and discern.

[120] *Glos. sup. Macr.*, comment. ad 1.14.6.

[121] *Guillelmi Glos. sup. Tim.* 71.13–14.

when he had attacked Abelard on the same grounds, Bernard of Clairvaux had dismissed this point as a non-issue.[122]

Not surprisingly, the *Glosae super Platonem* constitutes William's longest and final words on the subject of the *anima mundi*. This discussion, therefore, takes the Plato glosses as the basic point of departure on the subject of the *anima mundi*. In schematic form, William's account is structured as follows:

1. chs. 72–73: *Qualiter anima mundi in mundo sit locata*
2. chs. 74–76: *Ex quibus anima mundi a Creatore sit excogitata*
3. chs. 77–86: *Qualiter anima mundi a Creatore sit excogitata*
    a) *quare numeros in compositione animae posuit*
    b) *quare istos numeros in compositione posuit*
    c) *quare nec plures nec pauciores numeros in compositione posuit*
    d) *quare sub tali figura*
4. chs. 87–103: *Coniunctio animae mundi et corporis et officia quae in eo exercet*

First, the matter of location. William glosses *in medietate* as *in communi* and thereby 'locates' the *anima mundi* as fully extended throughout creation, and although wholly present in all creation, it does not exercise equal powers in all: *Vna enim et eadem anima mundi tota est in planetis sed motum ibi operans, in herbis et arboribus uegetationem, in brutis animalibus sensum, in homine rationem. Ita iuxta naturam singulorum in singulis operatur, tota in eis existens, sed non omnes potentias exercens.*[123] Harmony enters the discussion early on, even before its harmonic division, with William finding it in the term *reconciliatio*. According to Calcidius' translation, the world's body, through the application of the world soul, suffices for its own *reconciliatio*.[124] What is this *reconciliatio*? William explains: *Et*

[122] PL 182, 1062BC: Omitto quod dicit [. . .] Spiritum sanctum esse animam mundi; mundum, juxta Platonem, tanto excellentius animal esse, quanto meliorem animam habet Spiritum sanctum. Ubi dum multum suadat, quomodo Platonem faciat christianum, se probat ethnicum. Haec, inquam, omnia alisque istiusmodi naenias eius non paucas praetereo: venio ad graviora.

[123] *Guillelmi Glos. sup. Tim.* 71.22–26.

[124] *translatio Calcidii* 26.21: sufficeret conciliationi propriae nec extraordinario cuiusquam indigeret auxilio.

est reconciliatio de discordia ad concordiam aliquorum reductio,[125] and he locates this movement from discord to concord within the elements and the *temperies anni*:[126]

> Inter elementa uero est quasi quaedam discordia, quoniam unum de elementis alquid de alio consumit in substantiamque sui transformat, ut calor ignis aliquid de terra et aequa et aere. Sed huius discordiae est reconciliatio quia quantum de uno elemento in uno tempore consumitur, tantum de alio in idem reformatur, ut praedictum est, quia quantum de aqua in aestate consumitur tantum in hieme restauratur.

The world is always, William continues, concordant with itself, and from that perpetual concord, the world acquires highest blessedness and divine power.[127]

Passing over William's discussion of the components of the world soul, the next question is how the world soul was forged. The first sticking point is the matter of its creation at all. William knows well that to speak of the world soul as created would, if the identification of the world soul and the Holy Spirit were maintained, introduce heresy: no person in the Trinity could be 'created.' William notes that the term used by Plato/Calcidius, *excogitare*, rightly describes the 'generation' of the world soul, for it was neither made (*factus*), created (*creatus*), nor generated (*genitus*) but rather proceeds (*procedens*).[128] And he continues with an appeal to the *aurea catena*, in which the world soul is the *tertium genus*: *Diuina enim essentia ita est quod a nullo, diuina uero sapientia est ab illo, anima mundi ex utroque, caelestia corpora ex illis tribus, terrestria ex quatuor.*[129] As to its harmonic structure, William delves into far greater detail than Bernard. He explains in meticulous detail the ratios that obtain between the initial limits and the interposed means,[130] appeals at length to Boethius' *De institutione arithmetica* to explain the three different kinds of proportionality,[131] and finally gives a full mathematical proof that the minor semitone consists in (and only in) the ratio 256:243, a proof that amounts to a short, quasi-independent treatise on the division of the tone.[132] The base text for

[125] *Guillelmi Glos. sup. Tim.* 72.15–16.

[126] *Guillelmi Glos. sup. Tim.* 72.15–23: For among the elements there exists a kind of discord, because one of the elements consumes something from another of the elements and transforms it into its own substance (for instance the heat of fire consumes and transforms something from earth, water, and air). But there is a reconciliation of the discord because however much of one element in one season is consumed, an equal amount is reshaped into that same element from still another element, because, however much water is consumed in the summer, the same amount is restored in the winter.

[127] *Guillelmi Glos. sup. Tim.* 72.30–34: Deinde subiungit quid inde sequatur: AMICVMQVE SEMPER SIBI id est concordem GENVIT eum; ET IDEO quia ibi est perpetua concordia, SVMME id est perfecte BEATVM, quia ei nullum bonum deest, ET PRAEDITVM DIVINA POTENTIA, id est indissolubilitate.

[128] *Guillelmi Glos. sup. Tim.* 74.3–6: Et bene dicit 'excogitauit' et non 'creauit' secundum quod anima dicitur Spiritus Sanctus. Non enim a Deo factus est nec creatus nec genitus sed procedens est Spirtus Sanctus.

[129] *Guillelmi Glos. sup. Tim.* 74.9–12.

[130] *Guillelmi Glos. sup. Tim.* 80–81.

[131] *Guillelmi Glos. sup. Tim.* 82–83.

[132] *Guillelmi Glos. sup. Tim.* 84–86.

such a discussion was, of course, Boethius' *De institutione musica* 2.28–30, but William's mathematical method reveals a pedagogical distillation of Boethius' calculations. Boethius' demonstration that the minor semitone consists in the proportion 256:243 is not light reading, and though he gives his readers a few basic *regulae* to grasp along the way, these rules are neither numerous nor frequent. William makes liberal use of such 'shortcut' *regulae* for his calculation of the ratio. Moreover, several of these rules are either not found, or at least not formulated as such, in Boethius' mathematical texts. William, for instance, offers a *regula in musica* that determines whether two numbers are in a given superparticular proportion,[133] and likewise a rule for generating numbers that contain a specified part.[134] William concludes, however, by begging off (with a learned glance to Macrobius) a further discussion of the semitonal mathematics. Exactly why the tone cannot be divided into two equal parts, and what the ratio of the greater semitone (the *apotome*) is, cannot be discussed here: *Non enim, si facit hic mentionem de musica, sunt omnia dicenda quae de ea dici possunt*.[135]

The St. Florian commentator's discussion of the *anima mundi* is based upon a deep syncretism of the Calcidian Timaeus, Macrobius, and Martianus. His comments are spurred by the mention of the *anima mundi* in Boethius' prooemium.[136] The St. Florian commentator first notes that where Boethius ought to speak about nature, he speaks instead about the *anima mundi*, as nature has its cause in its likeness.[137] The *anima mundi*, as in William, is a *spiritus* infused throughout the *machina mundi* that imparts what is proper to each: some beings receive a vegetative force, some vegetative and sensitive force, and a select few (namely humans) receive all three: the vegetative, sensitive, and rational forces.[138] The commentator then identifies, without any qualification or indication that the position might be challenged by some, the *anima mundi* with the *spiritus sanctus*, and this identification sets in motion a deeply synthetic chain of identifications: *haec est spiritus sanctus, quae in aurea catena tercia ponitur et greco vocabulo endelichie nuncupatur*. The commentator has stepped,

[133] *Guillelmi Glos. sup. Tim.* 86.7–12: Est enim regula in musica quod si duo numeri dicantur esse in aliqua superparticulari proportione et uelimus probare utrum ita sit an non, multiplicemus nomen a quo proportio denominatur per differentiam; si inde fit minor numerus sunt in illa proportione, sin alter non sunt in illa.

[134] *Guillelmi Glos. sup. Tim.* 85.1–5: Est alia regula artis arismeticae. Si in aliquibus numeris in aliqua proportione constitutis quaeramus partem quam non habeant, multiplicemus illos nomine partis quam quaerimus. Qui inde fient, in eadem erunt proportione et partem quam quaerimus optinebunt.

[135] *Guillelmi Glos. sup. Tim.* 86.26–34.

[136] *Inst. mus.* 1.1 (180.4–5): non frusta a Platone dictum sit, mundi animam musica convenientia fuisse coniunctam.

[137] *In inst. mus.* 28: ecce quod loquitur de anima mundi, cum de natura loqui deberet, nam natura ad similitudinem illius causata est.

[138] *In inst. mus.* 28: Anima mundi est spiritus omni mundanae machinae infusus omnibus motum prestans, ita quod quibusdam etiam vegetationem, aliis cum vegetatione etiam sensualitatem, aliis cum vegetatione et sensualitate rationabilitatem.

for the moment, outside of Boethius and has turned instead to Macrobius, where he would have found the Homeric golden chain, which begins from the highest god, from which comes mind, and from that in turn comes soul.[139] The identification of the world soul with *endelichia* (= Grk. ἐντελέχεια), however, suggests that more than Macrobius is at work here, for Macrobius does not mention *endelichia* in this context.[140] The identification of *endelichia* with the world soul, rather, was a product of the Carolingian commentary tradition on Martianus, whose mythological allegory of the soul casts *Psyche* as the daughter of the Sun and Endelichia.[141] Both Eriugena and Remigius read Martianus through the lens of Calcidius and identified *endelechia* with the *anima mundi*,[142] and (likely through Remigius) the theory entered the twelfth-century commentary tradition. The appearance of *endelechia* in a commentary on Boethius' *De institutione musica* reveals that the commentator was approaching Boethius from the standpoint of the commentary tradition on both Martianus and Macrobius. The passage reads as follows:[143]

> Haec est spiritus sanctus, quae in aurea catena tercia ponitur et greco vocabulo endelichie nuncupatur, de qua dicit Macrobius quod qua parte duo priora respicit, plenam eorum tenet similitudinem, sed inferiora respiciens paulatim degenerat et imminuitur; non tamen imminuitur, sed ideo imminui videtur, quia in quibusdam quasdam suas et non omnes

[139] Macrobius, *In Som. Scip.* 1.14.15 (58.2–13): secundum haec ergo cum ex summo deo mens, ex mente anima fit, anima uero et condat et uita compleat omnia quae sequuntur, cunctaque hic unus fulgor illuminet et in uniuersis appareat, ut in multis speculis per ordinem positis uultus unus, cumque omnia continuis successionibus se sequantur degenerantia per ordinem ad imum meandi: inuenietur pressius intuenti a summo deo usque ad ultimam rerum faecem una mutuis se uinculis religans et nusquam interrupta conexio. et haec est Homeri catena aurea, quam pendere de caelo in terras deum iussisse commemorat.

[140] Macrobius mentions the term only once, in his doxography of the soul (1.14.19): Aristoteles [dixit animam] ἐντελέχειαν.

[141] *De nuptiis* 1.7 (4.10–13): voluit saltem Entelechiae ac Solis filiam postulare, quod speciosa quam maxime magnaque deorum sit educata cura; nam ipsi Ψυχῇ natali die dii ad convivium corrogati multa contulerant.

[142] Cora E. Lutz, ed., *Iohannis Scotti Annotationes in Marcianum* (Cambridge, MA: The Mediaeval Academy of America, 1939), 10.16–24: Entelechia ut Calcidius in expositione Timei Platonis exponit perfecta aetas interpretatur. Aetas quippe adulta ἡλικία a Grecis dicitur. Entelechia vero quasi ἐντὸς ἡλικία, hoc est intima aetas. Generalem quippe mundi animam Entelechiam Plato nominat, ex qua speciales animae sive rationabiles sint sive racione carentes in singulas mundani corporis partes sole administrante, vel potius procreante, procedunt ut Platonici perhibent. Quorum sectam Martianus sequitur asserens Psichen, hoc est animam, Entelechie ac Solis esse filiam. Lutz, *Remigii Autissiodorensis Commentum in Martianum Capellam* 1:76.11–13: Endelychia secundum Calcidium perfecta aetas, secundum Aristotelem absoluta perfectio interpretatur. Plato tamen Endelychiam animam mundi dicit. Cf. Calcidius, *In Tim.* 222 (236.5–7). On which, see Gerard Mathon, "Jean Scot Érigène, Chalcidius et le problème de l'âme universelle," in *L'Homme et son destin d'après les penseurs du moyen âge. Actes du premier congrès international de philosophie médiévale, Louvain-Bruxelles, 28 août–4 septembre 1958* (Louvain: Nauwelaerts, 1960), 361–375.

[143] *In inst. mus.* 28: This [sc. *anima mundi*] is the holy spirit, which is placed third in the golden chain; in Greek it is called *endelichia*. About this Macrobius says that in that part by which it beholds the two prior entities, it holds the full similitude of them, but insofar as it beholds the lower entities, it degenerates a bit and is lessened [*In Som. Scip.* 1.14.6–7 (56.9–13)]. It is not, however, actually lessened but only seems to be so for this reason: in certain things it exercises only some and not all of its powers such that in some it exercises more, in others, less. And hence it is said to degenerate, because although it has perfection within itself, by infusing more powers in some things and less powers in other things, it seems to be lessened. Whence Bacchus is said to have been torn apart, limb by limb, by the giants, but afterwards, with his limbs gathered together and placed in a winnowing-fan, he emerged the next day, whole.

> exercet potentias, ita quod in quibusdam plures, in quibusdam pauciores, et ideo dicitur degenerare, quia cum in se perfectionem habet, suas infundendo potencias quibusdam plures, quibusdam pauciores imminui videtur, unde etiam Bachus dicitur a gygantibus membratim discerptus, sed post membris eius recollectis et in uanno [*scripsi*, Urano *Rausch*] positis postridie integer apparuit.

One debt is clear: that to William of Conches, in particular to the interpretation of Bacchus in the *Glosae super Macrobium*, and at several points the similarities are *ad litteram*. Here, in his comments on Macrobius, is how William interprets Bacchus as an *integumentum* of the world soul :[144]

> [...] uolunt philosophi quod anima mundi dividatur per singula corpora, quamvis idem non operetur in eis [...], et quia Bacus dicitur anima mundi, ideo de Bacho confingunt tale integumentum, quod in gigantomachia Bacus a gigantibus frustratim decerptus est et in uanno a diis positus in crastino rursus integer emersit [...], quod nichil aliud est nisi, quod gigantes dicuntur humana corpora, quasi de terra genita, quae discerpunt animam; sed in uanno illa ponitur, quia uannus purgatio est levium et gravium, similiter mors levium et gravium, id est corporis et anime; sed quamvis per corpora nostra anima diuidatur, tamen tota integra reperitur.

Peter Dronke has noted rightly, I think, that this passage suggests a polarity in the world soul: 'it is both immanent and transcendent.'[145] As both William and the St. Florian commentator note, the world soul is divided among bodies through the different functions – vegetative, sensory, and rational – that it fulfills within each body (according to its need). Yet, it is still present, as a whole, in every life and limb, even though it exercises its powers differently in each being. The presence of this integumental fable of Bacchus in what may seem an extraordinarily unrelated place, namely a commentary on Boethius' *De institutione musica*, highlights the very close connection between the St. Florian commentary and William's early works, in particular the commentary on Macrobius. Might not the St. Florian commentary be an echo of William's lost commentary on the *De institutione musica*? The question, I think, cannot be settled, but it is worth asking. At the very least, we should consider the possibility that the St. Florian commentator had access to and used the commentaries

[144] *Glos. sup. Macr.*, comment. ad 1.12.12: Because philosophers think that the world soul is divided throughout individual bodies, although it does not perform the same things within them. [...] And because the world soul is called Bacchus, for this reason philosophers have confabulated such an *integumentum*: that in the battle of the giants, Bacchus was torn apart, limb by limb, by the giants and placed in the winnowing-fan by the gods. On the next day, he emerged whole. [...] This means nothing other than that the giants are called human bodies, as if born from the earth, which tear apart the soul, at least with respect to its power. But the soul is placed in a winnowing-fan, because the winnowing-fan is the purgation of the heavy and the light; similarly, death is the purgation of heavy and light, that is of body and soul. But although the soul is divided among our bodies, nevertheless it is found whole and integral.

[145] Peter Dronke, *Fabula: Explorations into the uses of myth in Medieval Platonism*, Mittellateinische Studien und Texte 9 (Leiden: Brill, 1974), 24.

of William of Conches as a way of unpacking the Platonic references scattered throughout the *De institutione musica*.

A similar nexus of *anima mundi*, *endelichia*, and *spiritus sanctus* is found in an anonymous *Expositio super librum Martiani Capelle de Nuptiis Phylologie* copied into a late fourteenth-century Florentine manuscript. Biblioteca Nazionale Centrale, Conv. Soppr. I.1.28 is a composite paper manuscript of Petrarch's letters, and the manuscript's final section (new paper, new hand, similar date) switches abruptly from epistolography to mythography.[146] After an anonymous *Quedam geneologia deorum* sets the mythographical tone, the remarks on Martianus are inaugurated by the heading *Allegoria et expositio quarundam fabularum poeticarum*. Several folios later, the scribe appears to signal a new, second text, distinguished from the first by a new heading, *Expositio super librum Martiani Capelle de Nuptiis Phylologie*, which commences with a fragmentary accessus to Martianus and then, abruptly, mid-sentence, resumes the mythographic notes by picking up where it had left off. Peter Dronke first noted the contiguity of the two texts: despite the interruption of the new heading and accessus, they in fact constitute a set of continuous notes on Martianus' *De nuptiis* through the beginning of book two.[147]

The Florentine text makes little attempt to engage, much less thoroughly explicate, Martianus' narrative, and it rarely connects its comments explicitly to the *De nuptiis*. It is not a lemmatized commentary, but a disjointed set of *nota quod*s and *nota quia*s – that is, as its initial title suggests, it is a collection of mythological notes on the gods in Martianus' pantheon, discussed and allegorized in the order that they appear in the course of his narrative. It is difficult to determine when the notes acquired their present form, but there are several hints that they were mined from an earlier lemmatized commentary. Dronke has drawn attention to several striking points of overlap with the thought of William of Conches: namely, the medical interpretation of Hymenaeus, the glossing of ancient gods (particularly Bacchus and Ceres) as natural forces, the allegorical reading of Proserpina and Ceres, and finally the identification of the Timaean *anima mundi* with the *spiritus sanctus* – the divine ardor of charity and the source of life for all creation. These parallels led Dronke to suggest,

[146] On the manuscript's history and structure, see Berthold L. Ullman, "The Composition of Petrarch's 'De vita solitaria' and the History of the Vatican Manuscript," in *Studies in the Italian Renaissance*, Storia e letteratura 51 (Rome: Edizioni di Storia e letteratura, 1998), esp. 135–45, 173–175.

[147] Dronke, *Fabula: Explorations into the uses of myth in Medieval Platonism*, 169; Peter Dronke, "William of Conches's Commentary on Martinaus Capella," in *Études de civilisation médiévale (IXe–XIIe siècles). Mélanges offerts à Edmond-René Lebande* (Poitiers: Centre d'Etudes Supérierues de Civilisation Médiévale, 1974), 224–225.

albeit with considerable caution and careful qualification, that the redactor of the Florentine notes, perhaps a 'disciple' of the Chartrian master, had quarried William's 'lost' *Glosae super Martianum* and 'excerpted from it a series of memoranda.'[148] 'A number of precious passages,' he concludes, 'are unlikely to stem from anyone save the admired and joyfully remembered *grammaticus de Conchis*.'[149] Recent scholars have not been so circumspect in their appraisals. Claudio Leonardi subtitled a discussion of the Florentine glosses, 'The Interpretation of William of Conches,' and deemed the author 'der Carnotenser';[150] Jane Chance likewise described it with confidence as 'almost certainly a set of notes by one of [William's] students,' and refers throughout to 'William's "Martianus commentary."'[151] Scholarly consensus, after all, gathers force like rumor: *uires adquirit eundo*. Dronke's caution was well founded, for the commentary upon which the Florentine text depends is still (partially) extant, though heretofore unrecognized, in a late-twelfth- or perhaps early-thirteenth-century Cistercian manuscript, Zwettl, Stiftsbibliothek, 313, ff. 142v–179v. But compounding the layers of complexity is that Zwettl itself is not a fully independent text, for approximately ten folios into the manuscript, the Zwettl commentary coincides with yet a third Martianus commentary, that preserved in a fifteenth-century Berlin manuscript, which has been edited by Haijo Westra.[152] (Dutifully, then, the Florentine text coincides with Berlin at the very same point that Zwettl does: namely at *De nuptiis* 1.14.)[153] The Florentine notes, however, have not been excerpted directly from the Zwettl commentary, and the variants point to a common ancestor. Moreover, the Florentine redactor seems to have had access to a more complete copy than what is now extant in the Zwettl manuscript, as the latter lacks both accessus and commentary on *De nuptiis* 1.1–1.3.

The Zwettl-Berlin-type commentary, undoubtedly the primary source for the Florentine notes, is not by William of Conches. First, the fragmentary accessus copied amid the Florentine notes, which, on stylistic grounds, appears to have been drawn from the same commentary represented

[148] Dronke, *Fabula: Explorations into the uses of myth in Medieval Platonism*, 179; Dronke, "William of Conches's Commentary on Martinaus Capella," 232.

[149] Dronke, *Fabula: Explorations into the uses of myth in Medieval Platonism*, 179.

[150] Claudio Leonardi, "Der Kommentar des Johannes Scotus zu Martianus Capella im 12. Jahrhundert," in *Eriugena redivivus. Zur Wirkungsgeschichte seines Denkens im Mittelalter und im Übergang zur Neuzeit*, ed. Werner Beierwaltes, vol. 1, Abhandlungen der Heidelberger Akademie der Wissenschaften, Philosophisch-Historische Klasse, Jahrg. 1987 (Heidelberg: C. Winter, 1987), 84–88.

[151] Jane Chance, *Medieval Mythography I: From Roman North Africa to the School of Chartres, A.D. 433–1177* (Gainsville, FL: University Press of Florida, 1994), xxxi and 418ff.

[152] Haijo Jan Westra, ed., *The Berlin Commentary on Martianus Capella's De nuptiis Philologiae et Mercurii*, Mittellateinische Studien und Texte (Leiden: Brill, 1994).

[153] Hence, Florence, Conv. Soppr. I.1.28, 60r.2–5=*The Berlin Commentary*, 153.9–12; 60r.5–8=*The Berlin Commentary*, 153.13–16; 60r.8–12=*The Berlin Commentary*, 154.14–24, etc.

by the Zwettl manuscript, does not follow William's standard accessus style[154] but closely approximates, at times word for word, the Berlin accessus. Nor do we find in the Zwettl-Florentine text anything like William's commentary method.[155] On the contrary, the Zwettl-Florentine commentary presents a very different stylistic profile that has no parallel in William's works. To offer just a few examples, the Zwettl-Florentine commentary schematizes its interpretations around a *triplex lectio*: *historica siue fabulosa, physica, et philosophica*.[156] Similarly it follows the Berlin commentary in a much more scholastic and systematic approach to narrative: *Omni autem narrationi quinque conuenienter aptantur: quis, quid, qualiter, quibus adminiculis, quare*.[157] And finally, two authorities cited in Zwettl – Rhabanus Maurus and Gerbertus Papa (presumably Gerbert d'Aurillac) – are never cited by William anywhere in his known corpus.

What, then, are we to make of the conceptual parallels that Dronke claimed to have found? Prudence demands caution. The parallels are not strong enough to constitute firm proof that we hear in the Florentine/Zwettl commentary a sure echo of William's lost *Glosae super Martianum*, for they could easily have been drawn from William's other works. Such an echo can be seen in the *Commentum in Martianum* attributed to Bernard Silvestris, which clearly draws on William's *Glosae super Platonem* and *Philosophia*. Are the parallels in fact indebted to the lost *Glosae super Martianum*? That answer may still lie buried in the nine known twelfth-century Martianus commentaries, of which only three have been edited.[158]

The identification of Zwettl, however, allows us to improve the text of Florence in many passages. A case in point is the anonymous commentator's discussion of *endelichia*:[159]

[154] On which, see the Jeauneau, *Guillelmi de Conchis Glosae super Platonem*, li; for an edition of the accessus, see Andrew Hicks, "Martianus Capella and the Liberal Arts," in *The Oxford Guide to Medieval Latin Literature*, ed. David Townsend and Ralph Hexter (Oxford: Cambridge University Press, forthcoming), 324–328.

[155] E.g., *continuatio*, *quandoquidem… ergo*, *uere… nam*, *dicet aliquis…*, etc.

[156] Florence, Conv. Soppr. I.1.28, 5or.

[157] Zwettl, Stifts., 313, f. 142v.

[158] I am completing a full edition and study of the Zwettl/Florentine commentary, which will address this question in more detail.

[159] Florence, Conv. Soppr. I.1.28, 57r; Zwettl, Stiftsbib., 313, 145v: Endelichia according to Plato means 'inner life,' according to Aristotle it means 'absolute pefection'. Both of these refer to the world soul. For the world soul is called 'inner life' in accordance with which all things are vivified; it is called 'absolute perfectio' because in the *Timaeus* the world soul received its composition from the perfection of number. It is the world soul that grants natural motion to all things; in accordance with it, all things that have been vivified are quickened. Virgil says of the world soul: 'In the beginning, heaven, earth, and the green fields, the moon's lucent globe and the stars of the Titans' – all these are sustained by an inner spirit.' About this spirit, the Apostle [says], 'the spirit in which we exist, in which we live. Some understand this as the Holy Spirit, because it is God's benevolence that grants motion and life to all. Others say that it is a spirit created by God and extended through all the world's parts, in accordance with which all things are administered. But it is heretical to believe that some creature has such a great power over things. The lesser souls are

> Endelichia secundum Platonem interpretatur intima etas, secundum Aristotelem absoluta perfectio, quarum utraque ad animam mundi refertur. Ipsa enim intima etas dicitur secundum quam omnia uiuificantur et absoluta perfectio quoniam perfectione numerorum in Timeo [intimea *F*, intima *coni. Dronke*] compositionem sortita est [compositionem. . . est *Z*, compansatica *(uid.) F*, est *om. F*, ⟨est⟩ compensatio *coni. Dronke*]. Hec est que omnibus prestat motum naturalem, secundum ⟨quam⟩ omnia uiuificata uegetantur, de qua Virgilius: 'principio celum terras camposque uirentes [patentes *a. corr.*] lucentemque globum lune, titaniaque astra, spiritus intus alit.' De quo Apostolus: 'spiritus in quo sumus et in quo uiuimus'. Quod quidam intelligunt de spiritu sancto, quia dei beniuolentia est que omnibus motum prestat et uitam. Aliqui dicunt hoc esse quemdam spiritum a deo creatum et per totius mundi partes distensum, secundum quem omnia administrantur. Sed aliquam creaturam tantam habere in rebus potentiam credere hereticum est. Huius tanquam maxime anime filie dicuntur minores anime. Vnde ex residuo eiusdem materie facte perhibentur a Platone. Quod bene conuenit spiritu sancto. Que enim est causa creationis humane anime nisi diuina beneuolentia?

Donke's conjecture that the soul is perfect 'because her inner balance lies in the perfection of numbers,' (*quoniam perfectione numerorum intima ⟨est⟩ compensatio*) can now be corrected in light of Zwettl's improved text: the soul is perfect 'because in the *Timaeus* the world soul received its composition from the perfection of number' (*quoniam perfectione numerorum in Timeo compositionem sortita est*). The Timean *psychogonia* remains the central point of reference. The commentator's theological emphases (*que enim est causa creationis humane anime nisi diuina beneuolentia*), however, point us to Abelard.

The Peripatetic of Pallet (cf. John of Salisbury, *Metalogicon* 1.5) first approached the *anima mundi* peripatetically through a philosophical back door. The issue arose in the *Dialectica* out of an unlikely context, namely the treatment of parts and wholes. Querying the division of a virtual whole into parts *secundum formam*, Abelard's working example is the division of the soul into its three powers, the *potentia uegetandi*, *sentiendi*, and *discernendi*, of which plants have only the first and animals the first two; man alone possesses all three. Abelard then raises the question: 'But we must consider whether a division of this sort occurs more correctly with regard to the soul generally, or with regard to the world soul, which Plato thought to be singular and which others assert to be a species contained by one individual, such as the Phoenix.'[160] After dealing with the first option in a conventionally Boethian manner, he returns to the world soul. 'There are those,' Abelard claims, who accept this

called the daughters of this, as it were, greatest soul. This is why Plato said that they were created from the residue of the same substance. This accords will with the Holy Spirit. For what else is the cause of the human soul's creation if not divine benevolence?

[160] *Dial.* 555: Sed utrum de anima generali siue de anima mundi, quam singularem Plato cogitauit quamque alii speciem contentam uno indiuiduo asserunt, sicut est Phenix, diuisio huiusmodi rectius fiat considerandum est.

division of a virtual whole not with regard to the soul in general, but a singular soul, which Plato deemed the *anima mundi*.'[161] He continues:[162]

> quam [sc. animam mundi] ipse ex Nou, idest Mente Diuina, natam [*scripsi*, nature *de Rijk*][163] asseruit et eamdem in omnibus simul esse corporibus fi⟨n⟩xit. Non tamen omnia animatione replevit, sed illa sola quorum mollior [est] natura ad animandum fuit idonea; cum enim eadem et in lapide tota simul et in animali credatur, in illo tamen pre duriti⟨a⟩ corporis suas exercere potentias non potuit, sed omnis anime uirtus in eo cessauit.

The language of this passage, as well as Abelard's subsequent explanation of how *nonnulli catholicorum* understood Plato's teaching on the world soul, reveals the source of Abelard's remarks. He is not working here solely from the the *Timaeus*, but is reliant upon the account of Macrobius,[164] and presumably also knew the Macrobian commentary tradition, which Abelard seems to have in his sights in his critique:[165]

> Sunt autem nonnulli catholicorum qui allegorie nimis adherentes Sancte Trinitatis fidem in hac consideratione Platoni conantur ascribere, cum videlicet ex Summo Deo, quem tagaton appellant, Noun natam [natam *scripsi*, naturam *de Rijk*] intellexerunt quasi Filium ex Patre genitum, ex Nou vero animam mundi esse, quasi ex Filio Spiritum Sanctum procedere. Qui quidem Spiritus, cum totus ubique diffusus omnia contineat, quorumdam tamen fidelium cordibus per inhabitantem gratiam sua largitur charismata, que uiuificare dicitur suscitando in eas uirtutes; in quibusdam uero dona ipsius uacare uidentur, que sua digna habitatione non inuenit, cum tamen et [in] ipsis presentia eius non desit, sed uirtutum exercitium.

In his later theological works, Abelard returns to the *anima mundi*, and he seems to have made a surprising about-face.[166] Employing language surprisingly similar those whom he had criticized

[161] *Dial.* 558: Sunt autem et qui hanc diuisionem uirtualis totius non de anima generali sed singulari, quam Animam mundi Plato uocauit, accipiunt.

[162] *Dial.* 558: He [sc. Plato] claimed that the world soul was born from *nous*, i.e., the Divine Mind, and feigned that it was present within all bodies simultaneously. It did not, however, animate all things, but only those whose gentler natures were suited to animation. For although the same soul is believed to be wholly within stones and animals simultaneously, was not able to exercise its powers in the former because of the hardness of their bodies, but every one of the soul's powers remained inactive in the stone.

[163] Cf. Macrobius, *In Som. Scip.* 1.2.14 (6.25–27): mentem, quem Graeci *νοῦν* appellant [. . .] ex summo natam et profectam deo. 1.2.16 (7.11): summus deus nataque ex eo mens.

[164] As pointed out in John Marenbon, "Life, Milieu, and Intellectual Contexts," in *The Cambridge Companion to Abelard*, ed. Jeffrey E. Brower and Kevin Guilfoy (Cambridge: Cambridge University Press, 2004), 37.

[165] *Dial.* 558: There are, however, a few of the Catholic faith who, in their excessive adherence to allegory, try to ascribe to Plato faith in the Holy Trinity with the following argument: they understand Nous to have been born from the Highest God (whom they call *tagaton*) [cf. Macrobius, *In Som. Scip.* 1.2.14 (6.23)], like the Son from the Father, but the world soul to have been born from *nous*, like the Holy Spirit proceeds from the Son. This Spirit, since it is wholly diffused everywhere contains all, bestows its spiritual gifts (*charismata*) in the hearts of some of the faithful through an in-residing grace, which it is said to vivify since it arouses virtues within them; in others, however, its gifts seem to be absent, as it does not find them to be worthy of its habitation, even though not its presence but only the exercise of its powers is lacking.

[166] On the details, see Bezner, *Vela Veritatis: Hermeneutik, Wissen und Sprache in der Intellectual History des 12. Jahrhunderts*, 113–119; John Marenbon, "The Platonisms of Peter Abelard," in *Aristotelian Logic, Platonism, and the Context*

as *allegorie nimis adherentes*, he now approves and promulgates the integumental interpretation of the *anima mundi* as *spiritus sanctus*. It is, in fact, a *pulchrum inuolucrum*. Moreover, he adds to his discussion musical language that was entirely absent from the *Dialectica*. Abelard still comes to the Platonic doctrine by way of Macrobius, and he offers in his theological triptych a sensitive reading of Macrobius (going well beyond the reading offered by William of Conches in his *Glosae super Macrobium*).[167] In the first book of his *Theologia 'Summi boni'*, after citing the testimony of the prophets concerning the Trinity, he turns to the philosophers,[168] and after a brief discussion of 'Mercurius' from the Hermetic tradition, Abelard turns his attention to the *maximus philosophorum*, Plato, 'who, as testified by the Church Fathers, came closer to the Christian faith than any other pagan philosopher.'[169] The Trinity discovered by Plato consists in the Macrobian Trinity denied in the *Dialectica*: highest God (the Father), the Mind born from God (the Son), and the Soul that proceeds from Mind. This soul, Abelard now allows, is a Platonic expression, *per pulcherrimam inuolucri figuram*, of the Holy Spirit.[170] Here is Abelard's central claim:[171]

> Conferant humane anime corporibus nostris animalem uitam; conferat anima mundi, quam spiritum sanctum intellexit, ipsis animabus uitam spiritualem distributione suorum donoroum, ut sint singule anime uita corporum, spiritus autem sanctus uita animarum, quas uirtutibus uegetando ad bonorum ⟨operum⟩ profectum promouet. Quodam itaque modo anime nostre corpora quedam spiritus sancti dicende sunt, quas ipse per aliquod gratie sue donum inhabitat et uirtutibus uiuificat. Sed et illud quod aiunt animam totam,

of Early Medieval Philosophy in the West (Aldershot: Ashgate, 2000), 118–122; Marenbon, "Life, Milieu, and Intellectual Contexts," 35–38.

[167] ibid., 38: 'Although he [sc. Abelard] and William think that Macrobius is talking about the Trinity, the lack of common ground between these remarks and William's commentary is striking. Even the point about the diversity of gifts of the Holy Spirit is changed and subsumed into a wider, more complex reading.' Bezner does not consider the question: *Vela Veritatis: Hermeneutik, Wissen und Sprache in der Intellectual History des 12. Jahrhunderts*, 111, n. 65: 'Die insbesondere von E. Jeauneau vermerkte Nähe der Positionen Wilhelms und Abailards [...] kann im Rahmen dieser Studie nicht untersucht werden.'

[168] *TSum* 1.5.30 (295–297): Nunc autem post testimonia prophetarum de fide sancte trinitatis, libet etiam testimonia philosophorum supponere, quod ad unius dei intelligentiam ipsa philosophie ratio perduxit.

[169] *TSum* 1.5.36 (348–351): Reuoluatur et ille maximus philosophorum Plato, qui testimonia sanctorum patrum pre ceteris gentium philosophis fidei christiane accedens, totius trinitatis summam post prophetas patenter edocuit.

[170] *TSum* 1.5.37 (361–364): De hac autem anima, si diligentius discutiuntur ea que dicuntur tam ab hoc philosopho quam a ceteris, nulli rei poterunt aptari, nisi spiritui sancto per phulcherrimam inuolucri figuram assignetur.

[171] *TSum* 1.6.45–46 (473–488): Human souls confer animal life upon our bodies. The world soul, which he [sc. Plato] understood to be the Holy Spirit, confers on souls themselves a spiritual life through the distribution of its gifts. In this way soul is the life of bodies, but the world soul the life of souls. By quickening souls with its powers, it urges them to the profit of good works. Thus our human souls could be called, in manner of speaking, bodies for the Holy Spirit, as the Holy Spirit resides within them through the gift of its grace and vivifies them with its powers. But when it is said that the world soul is wholly diffused in individual bodies, that it vivifies all things, and that it animates everything it finds suitable to such animation (provided it is not impeded by their hardness or the density of their nature), this we must understand as a beautiful *inuolucrum*, because God's love, which we have called the Holy Spirit, when first infused in mens' hearts through the gift of faith or reason, vivifies some of us by urging us to the fruitfulness of good works; in others of us, however, the Spirit is said to be lacking, as the hardness of their depravity wars against the Spirit.

> singulis corporibus infusam, omnia uiuificare, atque animare que ad animandum idonea repperit, nulla ipsorum duritia uel ⟨densitatis⟩ natura impediente,[172] pulchrum est inuolucrum, quia caritas dei, quam spiritum sanctum diximus, cordibus humanis per fidei siue rationis donum primitus infusa, quaedam uiuificat, ad bonorum fructum operum nos promouendo ut uitam assequamur eternam, et in quibusdam ipse spiritus uacare dicitur, prauitatis eorum duritia repugnante.

In the first version of Abelard's Trinitarian theology, his comments on the musical implications of the world soul are brief. He writes:[173]

> Cui etiam philosophus totam uim et concordiam proportionalem numerorum tribuit, ut in diuinae gratiae bonitate uniuersarum rerum concordiam consistere doceat. Omnis quippe ordo naturae et concinna dispositio numerorum proportionibus uestigatur atque assignatur, et omnium perfectissimum exemplar numerus occurrit qui rebus congruit uniuersis. Quod quidem non latet qui philosophiae rimantur arcana. Hinc est etiam quod arithmetica, que tota circa proportiones numerorum consistit, mater est magistra ceterarum artium dicitur, quod uidelicet ex discretione numerorum ceterarum rerum uestigatio doctrinaque pendeat.

In the later versions (*Theologia Christiana* and *Theologia 'Scholarium'*) this same claim launches an impassioned encomium of the power of music and number, drawing largely on Boethius' *De institutione musica*:[174]

> Cuius etiam ut ineffabilem exprimerent benignitatis eius dulcedinem, totam ei musicarum consonantiarum adscribunt harmoniam, qua et ipsum iugiter resonare firmamentum et superiores mundi partes repleri perhibent. Nihil quippe est quod ita oblectet et nimia suauitate sui alliciat animos, sicut melodia. Nihil est ita pronum ad eos componendos et uel commouendos uel pacandos, ut iuxta illud primi capituli Boethianae Musicae scirent philosophi 'quod nostrae tota animae corporisque compago musica coaptatione coniuncta sit', adeo quidem ut iracundias insaniasque melodia sedari et grauissimarum infirmitatum dolores curari animaduerterent atque efficerent.

[172] Cf. Macrobius, *In Som. Scip.* 1.14.14 (57.34–58.1): sed usum eius hebescere in animalibus corporis densitate [...].

[173] *TSum* 1.6.53–54 (538–548): The philosopher also attributed to [the world soul] the full force and proportional concord of numbers so as to teach us that the concord of all things consists in the goodness of divine grace. For in fact the entire order of nature, its harmonious disposition, can be traced back and assigned to numerical proportions, and number offers the most perfect exemplar for all things, because it was congruent with all things. This fact does not escape all who search for the secrets of philosophy. Hence it is that arithmetic, which entirely concerns the proportions of numbers, is called the mother and master of the other arts, for the investigation and instruction of all other things depends on the discretion of numbers.

[174] *TChr* 1.80 (1051–1062); *TSch* 1.136 (1577–1588): In order that they might express the ineffable sweetness of its goodness, they ascribe the entire harmony of musical consonances to it, with which, they claim, the firmament itself continually resounds, filling the higher parts of the universe. Indeed there is nothing else that delights and entices minds with its exceptional sweetness quite like melody, nothing else so well suited to composing, affecting, and pacifying minds. Philosophers know, in accord with the first chapter of Boethius' book on music, that 'the entire union of our soul and body is conjoined by musical harmony,' so much so, in fact, that philosophers note and bring into effect that anger and madness by sedated and the pains of extreme illness be cured by melody.

This then leads Abelard to embrace the *musica caelestis* as an expression of the *theological* concord[175] conferred by the *spiritus sanctus*:[176]

> Bene itaque philosophi, immo Dominus per eos id forsitan ignorantes, tam ipsi animae mundi quam superioribus firmamenti partibus nimiam ac summam harmonicae modulationis suauitatem assignant, ut quanta pace, quanta fruantur corcordia, quam diligentius possent exprimerent, et quam concorditer cuncta in mundo diuina disponat bonitas; quam illi animam mundi, Veritas Spiritum Sanctum, ut dictum est, nominat. Quis enim, si diligenter attenderit, non animamduertat quod de caelesti dixerunt harmonia quae in superioribus firmamenti partibus incessanter resonat, cum caelestes uidelicet spiritus ex assidua diuinae maiestatis uisione et summa inuicem concordia ligentur, et in eius quem conspiciunt laudem iugi et ineffabili exultatione illud decantent, quod iuxta Isaiam seraphim die ac nocte conclamare non cessant: Sanctus, sanctus, sanctus Dominus Deos sabaoth, etc.

A similar emphasis on the theological aspects of the *anima mundi* is found in a mid-twelfth-century commentary on the Timaean *psychogogia*. Paris, Bibliothèque nationale, lat. 8624 is a composite manuscript including works of Seneca (select *epistulae* and excerpts from both *Naturales quaestiones* and *De morte Claudii*) and Apuleius (*De deo Socratis* and *De Platone et eius dogmate*, both incomplete). The first part (ff. 17r–22r) of the third quire (ff. 17–24) contains a commentary on Calcidius' Latin translation of the *Timaeus* 34b–36d.[177] The commentator – identified only by his surname, Hisdosus (perh. *Lehideux* in French), as he himself informs us: *appellor Hisdosus de patre*

[175] Already noted by Haar, "Musica Mundana," 297: 'The heavenly concert is here part of a Platonizing Christian theology. One suspects, however, that the literally-conceived 'sounding spheres' are yielding place to the theological metaphor.'

[176] *TChr* 1.84 (1117–1132); *TSch* 1.141 (1660–1673): Rightly, then, do philosophers (or rather, the Lord working through them in their state of ignorance) assign both to the world soul and to the upper parts of the firmament the exceedingly supreme sweetness of harmonic modulation, so that they might express, as diligently as they can, how great is the peace and concord enjoyed [by the world soul and firmament] and how concordantly divine goodness arranges everything within the universe. Philosophers call it the world soul; Truth, as we have already said, calls it the Holy Spirit. If anyone diligently examines this, disregard what philosophers have said about this celestial harmony, which unceasingly resounds in the upper parts of the firmament, for the celestial spirits, in their perpetual vision of divine majesty, are both bound together in the utmost concord and, with ceaseless and ineffable exaltation in praise of him whom they behold, sing the same praises that, according to Isaiah, the seraphim never – day and night – cease to sing: *Sanctus, sanctus, sanctus, dominius deus sabatoth* . . .

[177] I have prepared a full edition and commentary on the text, which will deal the text in far more detail than can be done here. Tullio Gregory has edited the opening section of the commentary (ff. 17r-17v.25) in *Platonismo medievale. Studi e ricerche*, 126–132 and Edouard Jeauneau prints excerpts in a appendix to *Guillelmi de Conchis Glosae super Platonem*, 331–337. The hand is a late-Caroline, proto-Gothic *textualis* featuring a single compartment *a*, occasional biting, and the uncrossed Tironian *et*. Both Gregory (Gregory, *Platonismo medievale. Studi e ricerche*, 122) and E. Jeauneau (personal conversation) agree that the hand is of the twelfth century. Homeoteleuton corrected by expunctuation and several errors (*semper amabilia* for *separabilia*, *quoniam* for *quae in*), easily explained by misread or misplaced macrons, clearly indicate that it is not an autograph. The commentary is followed by three related but independent fragments (ff. 22v-24r): (1–2): two short anonymous glosses (ff. 22v–23r) on *Timaeus* 21e–24e: the first concerning the cyclical *inundationes* and *combustationes* of the world (f. 22v: Invndatio alia generalis, alia spiritualis . . .), the influence of the planets, and the myth of Deucalion, Pirra, and Phaeton; the second commenting on the birth of Erictonius (f. 23v: Legitur in libro qui mithologiarum inscribitur quod palladem de cerebro iouis natam uulcanus petiit . . .). These comments are related to the explanations given by William of Conches (*Guillelmi Glos. sup. Tim.* 24–30). (3): a short treatment of the *divisio philosophiae* (f. 23v: Phylosophia aliter describitur secundum nominis ethimologiam, aliter secundum rei essentiam . . .), discussed above in chapter two (2.8).

meo (f. 22r) – has been known since (at least) the end of nineteenth century, almost exclusively on the strength of an (inauthentic) fragment of Heraclitus, which compares the soul to a spider in a web.[178]

Hisdosus' approach to the *Timaeus* reflects the teaching of twelfth-century schools,[179] and it is enticing to suppose that Hisdosus was a student of both Abelard and William of Conches. Hisdosus' commentary on the *anima mundi* combines the theological emphases of Abelard's theological treatises with the mathematical, harmonic, and astronomical theories of William of Conches.[180] As Abelard does, Hisdosus reads Plato as a pagan prophet: *Plato namque et maximus philosophorum chorus multa de personarum trinitate et trinitatis unitate, ut testatur sanctus Augustinus et alii doctores ecclesiastici, fidei congrua dixerunt*.[181] To support the identification of the *anima mundi* with the *spiritus sanctus*, Hisdosus supplies careful arguments (see Appendix 5.6) that have no parallel in William of Conches' commentaries but recapitulate (though not without a degree of originality) explanations offered by Abelard. For example, Hisdosus argues that such an identification does not entail the eternity of the world, as a critic might object,[182] for the name *anima mundi* – akin to *praeceptor* or *pater* – is a name granted *ex officio*, namely the function of vivifying everything that exists in the world. Therefore, the *spiritus sanctus* is eternally whatever it is, but it is not eternally the *anima mundi*, and thus the world is not necessarily eternal.[183] In the *Theologia 'Summi boni'*, Abelard offers essentially the same argument to explain why the *anima mundi*, if it is an expression of the the *spiritus sanctus*, has a beginning in time: *'Spiritus' quippe nomen est naturae, 'anima' uero officii, ab 'animando' scilicet.*[184]

[178] H. Diels and W. Kranz, *Die Fragmente der Vorsokratiker*, 6th ed. (Berlin: Weidmann, 1952), Heraclitus, fr. 67a (1.166); cf. Calcidius, *In Tim.* 220 (233.19–22) (where the comparison is attributed to Chrysippus).

[179] *De anima mundi*, 17r: Diuinitate uniuersitatis conditrice favorem nobis praestante, infixa menti est sentitia Timaeum quantum ipsius a scolasticis nostris legitur cum facilius et commodius fieri poterit, a nobis glosandum. 18r: De origine porro humanae animae diuersas a diuersis doctoribus polatas fuisse sententias in scripturis aliorum uidimus et a meis magistris audiuimus.

[180] For a brief discussion of the parallels between Hisdosus and William, see Jeauneau, *Guillelmi de Conchis Glosae super Platonem*, 331–337.

[181] Paris, BnF, lat. 8624, 17r.

[182] The argument runs: (1) The *anima mundi* is the *spiritus sanctus*. (2) The *spiritus sanctus* is eternally whatever it is. (3) Thus the *anima mundi* is eternally whatever it is. (4) If the *anima mundi* is eternally the *anima mundi*, then the world is eternally animated by it. (5) If the world is eternally animated, then the world is eternal (see Appendix 5.6 for the Latin text).

[183] See Appendix 5.6. The argument is reprised later in the commentary (Paris, BnF, lat. 8624, 18r): ORTVM ANIMAE. Hic uidetur uelle spiritum sanctum habere principium uel eum mundi animam non esse. Sed neutrum uerum est, quia Deum annuisse ortum animae non est aliud quam mundum istum habuisse principium uegetationis, quam Deus sua bonitate ei contulit. Ille creator uel summus spiritus dicitur anima quia animat omnia quae in mundo uita decorantur, quemadmodum creati spiritus angeli dicuntur tunc solum cum mittuntur. Anima namque et angelus nomina sunt officiorum non naturaliter. Cf. Isidore, *Etym.* 7.5.2: Angelorum autem uocabulum officii nomen est, non naturae. Semper enim spiritus sunt, sed cum mittuntur, uocantur angeli.

[184] *TSum* 3.94 (1277–1281): Occurrit hoc loco illud determinandum quod Plato animam mundi incepisse uoluerit nec

In line with William of Conches, however, Hisdosus offers considerable detail on the harmonic construction of the world soul, and he structures his commentary in a manner that echoes William, noting, for instance, that any discussion of the world soul's division must address the following questions (Appendix 5.7):

1. *qualiter per numeros anima diuisa dicatur*,
2. *qualiter per septem*,
3. *et per hos septem*,
4. *qualiter unitatem in principio posuit*,
5. *qualiter pares et impares ab untroque latere diffluentes*,
6. *qualiter a pari et impari linears numeros apposuit et superficialis ⟨et solidos⟩*,
7. *qualiter partitionem suam in solidos terminauit*.

Finally, when Hisdosus discusses the full sweep of the soul's division, including the *leimma*, he (as did William) launches into a full blown treatise on micro-tonal mathematics (Appendix 5.8), proving how the ratio of the minor semitone can be determined, and he (as did William) employs a series of *regulae* as guideposts along the way.[185] But what is perhaps most striking about Hisdosus' commentary is that it makes almost no reference to the *musica caelestis*. It is mentioned only in passing, as an example of his claim that the massive *exagitatio* of the heavens cannot be perceived by the bodily senses, as the senses fail at both extremes, 'which,' he writes, 'is clearly apparent in the case of celestial harmony (with respect to hearing) and in the case of atoms (with respect to sight).'[186] Such is the only mention of the *musica caelestis* in Hisdosus' commentary, but in this way too Hisdosus reflects the larger pattern of thought in twelfth-century philosophical commentaries – for although

coaeternam esse deo et menti. Quod si diligenter consideretur, non est abhorrendum. Cum emm spiritum sanctum animam magis quam spiritum appellauerit quasi ab 'animando', hoc est uiuificando nos donis suae gratiae per incrementa uirtutum, non semper anima, id est uiuificans, spiritus fuit, quia dum nondum creaturae essent quibus dona sua distribueret, nullam donorum distributionem exercebat. Sicut ergo spiritum sanctum, qui in se est omnino simplex, multiplicem tamen dicimus et septem spiritus appellamus secundum diuersitatem donorum, ita etiam philosophus eundem, qui ⟨in⟩ essentia propria aeternaliter subsistit incepisse quantum ad effecta sua uoluit, ex quibus eum animam magis quam spiritum appellauit. 'Spiritus' quippe nomen est naturae, 'anima' uero officii, ab 'animando' scilicet (cf. *TSch* 2.174 (2520–2533); *TChr* 4.145 (2287–2301)).

[185] See Appendix 5.8, along with the apparatus fontium, which supplies the parallels with William of Conches.

[186] *De anima mundi*, 22r: Constat inter omnes recte philosophantes tantam esse caeli exagitationem quod sensu corporeo percipi non potest. Ipse enim circa quaeque maxima et minima deficit, quod in caelesti armonia (de auditu) et atomis (de uisu) liquido apparet.

the existence of the heavenly harmony is generally maintained across the century, its reality as an astronomical system faded from view.

5.5 *Musica caelestis*

As Fronesis, the reluctant heroine of Alan de Lille's *Anticlaudianus*, begins her noetic ascent to the throne of Theology, first buffeted by the four winds within the dense air of the cosmos' lower strata, she eventually reaches the crystalline stillness of the first celestial sphere *quo gracior aura cuncta fovet, quo cuncta silent*. But the silence is not absolute:[187]

> hic rerum novitas, rerum decus, unica rerum
> forma, decor mundi visum demulcet euntis
> virginis et cantus species nova debriat aurem,
> sed parco tamen auditu sonituque minore
> concipit illa sonum, certa tamen imbibit aure,
> qualiter hic sonitus cithare celestis obesis
> vocibus expirat, ubi lune sphera remisso
> suspirat cantu, rauce sonat, immo sonando
> pene silet, languetque sonans, nervique iacentis
> inferius gerit illa vicem, cordamque minorem
> reddit et in cithara sedem vix illa meretur.

Fronesis has thus joined the rarefied company of those who have been in audience to the music of the spheres. As James Haar has rightly argued regarding this passage, despite the Platonic planetary order (with the sun in the second sphere), it is doubtless Martianus' celestial scale that echoes through Alan's depiction.[188] Alan, though, does not assign particular notes to the spheres, Sirens, and Muses heard by Fronesis in her celestial assent. To be sure, the twelfth century was not lacking in planetary scales. Honorius of Autun's *Imago mundi* forges two (conflicting) scales: one mapping the planets to the first eight notes in the 'Guidonian' gamut, and the second based on the Plinian planetary distances.[189] Honorius' scale is even found glossing Macrobius in the later twelfth century (although

[187] *Anticl.* 4.345–355: Here the novelty and beauty of all things, the perfection of their form, the elegance of the cosmos charms the sight of the maiden as she passes, and a new sort of music intoxicates her ear; though she perceives the sound as barely audible and low in volume, she nonetheless drinks in with a ready ear how the sound of the celestial lyre issues forth in heavy tones. Here the Moon's sphere breathes out a languid song, sounds harsh, even falls nearly silent and grows faint as she resounds. She plays the role of a low-toned string, produces only a feeble note, and scarcely deserves to have a place in this music. Trans. Wetherbee (forthcoming), lightly modified.

[188] Haar, "Musica Mundana," 293–296.

[189] *Imago mundi* 1.86: In terra namque si Gamma, in Luna A, in Mercurio B in Venere C, in Sole D, in Marte E, in Iove F, in Saturno G ponitur, perfecto mensura musice invenitur. A terra usque ad firmamentum VII toni reperiuntur. A terra enim usque ad Lunam est tonus, a Luna usque ad Mercurium semitonium, a Mercurio usque ad Venerem semitonium, inde usque ad Solem tria semitonia, a Sole usque ad Martem tonus, inde ad Iovem semitonium, inde ad Saturnum

it is fundamentally at odds with the text it glosses).[190] Similarly, as Susan Rankin has recently reminded us, numerous late-eleventh and early-twelfth-century manuscripts present us with diagrams, even poetry and music (e.g., the *Naturalis concordia uocum cum planetis*), that are designed to teach the elements of music alongside the constitution of the world.[191] The presence of such diagrams and Honorian glosses notwithstanding, the commentators on the primary texts that developed the notion of celestial harmony – the *Timaeus*, Macrobius, and Martianus – are surprisingly silent about the particulars of this harmony, even when maintaining its existence. William of Conches, for instance, was generally content to note (wrongly!) the discrepancy between the ancients on the exact formulation of the celestial harmony,[192] and he did not (as did Eriguena, to give one of many examples) attempt to synthesize an explanation of his own.[193] In the *Glosae super Platonem*, when confronted by Calcidius' description of the celestial motion as a *chorea*,[194] William explains it as a 'circular dance performed with music,' and thus the *chorea* subsumes the *musica caelestis*, whose existence is proven by Macrobius, even if it exceeds the range of human hearing.[195] When the text circles back again to the *chorea stellarum*,[196] however, he observes that 'to explain this dance would be to demonstrate

semitonium, inde ad signiferum tria semitonia. Que simul iuncta VII tonos efficiunt. Tonus autem habet $\overline{\text{XV}}$DCXXV milliaria, semitonium vero $\overline{\text{VII}}$DCCCXII milliaria et semissem. Cf. Pliny, *Naturalis historia* 2.19–20.

[190] E.g., London, British Library, Arundel 338, f. 139v (glossing Macrobius, *In som. Scip.* 2.2.1). The passage is commonly found in collections of short musico-mathematical texts, e.g., Paris, Bibliothèque nationale, lat. 69v (= 47r according to a newer foliation), where it accompanies treatises on the *mensura fistularum*, the abacus, and Eratosthenes' geological calculations.

[191] Susan Rankin, "*Naturalis concordia vocum cum planetis*: Conceptualizing the Harmony of the Spheres in the Early Middle Ages," in *Citation and Authority in Medieval and Renaissance Musical Culture: Learning from the Learned*, ed. Suzannah Clark and Elizabeth Eva Leach, Studies in Medieval and Renaissance Music 4 (Woodbridge: Boydell, 2005), 3–19, discussing or mentioning: Fitzwilliam Museum, MS McClean 52/II, f. 5v; Paris, Bibliothèque nationale, lat. 2389, f. 51v; and Paris, Bibliothèque nationale, lat. 7203, f. 2v–3r.

[192] *Glos. sup. Macr.*, comment. ad 2.4.10: Cum Macrobius dicat ex celeritate firmamenti acutum sonum effici, grauem uero ex tardo lunae motu, si opponatur de Martiano quod dicit firmamentum efficere grauem sonum, lunam acutum, quid Martianus intellexerit suo loco dicemus. Non enim hoc loco illud exponemus. William seems to have in the Nicomachean scale from Boethius, *Inst. mus.* 1.27, for Martianus agrees with Macrobius in positing an ascending scale from the moon to the firmament, witnessed in both the Apollonian grove (1.11) and the scalar ascent mounted by Philologia throughout book two. The St. Florian commentator likewise jumbles the attribution of sundry scales. 'Plato et Socrates' are credited with the Nicomachean scale (*In inst. mus.* 34: *inter planetas Luna pro sui circuli brevitate acutiorem sonum emittit, ceteri autem quanto altiores sunt, tanto graviores faciunt; erat ergo gravissimus in firmamento*) and Aristotle (sic!) is credited with the more usual ascending scale from the moon to the firmament (*In inst. mus.* 34: *Aristoteles autem, qui magis et veritatem et probabilitatem in omnibus sequebatur, dixit quod acutior sonus in firmamento, gravissimus autem in Luna*).

[193] On Eriugena's dynamic and synthetic cosmic harmony, see Gabriela Ilnitchi Currie, "*Concentum celi quis dormire faciet?* Eriugenian Cosmic Song and Carolingian Planetary Astonomy," in *Quomodo cantabimus canticum? Studies in Honor of Edward H. Roesner*, ed. David Butler Cannata et al. (Middleton, WI: American Institute of Musicology, 2008), 15–35.

[194] *Tim.* 39b4; *translatio Calcidii* 31.22 (χορεύοιτο pro πορεύοιτο?).

[195] *Guillelmi Glos. sup. Tim.* 102.13–18: Chorea est circularis motus cum cantu. Sed cum octo sint quae in superioribus circulariter mouentur, scilicet firmamentum et planetae septem, sonum faciunt concordem ex motu suo, ut probat Macrobius. Sic ergo est in caelestibus quaedam chorea cuius motus potest oculis perperndi, sed sonus possibilitatem humanarum aurium excedit.

[196] *Tim.* 40c3; *translatio Calcidii* 33.23 (= χορείας).

which of the planets resounds with another planet in a diapente or some other consonance. But Plato omits to do so here.'[197]

Twelfth-century commentators followed suit and generally omitted detailed astronomical discussions of the music of the spheres.[198] Instead, the music of the spheres became a celestial model of human ethics, as in the commentary on Martianus ascribed to Bernard Silvestris. As we may recall from chapter two, this commentary re-ordered the Boethian tripartition and elevated *musica humana* above *musica mundana*.[199] This reshuffling has further implications, for the epistemological framework necessitates that the *musica caelestis*, so often cast as the pinnacle of musical understanding, be subordinated to the *musica humana*. He effects this subordination by developing an idiosyncratic and highly synthetic account of the music of the spheres. Bernard remains mute on most traditional topics pertaining to celestial harmony, offering no planetary scales, little in the way of celestial mechanics, and only a brief explication of its inaudibility in the sublunar realm.[200] But a curious etymological gloss on the Camenae, the Roman goddesses identified with the Greek muses, afforded him an opportunity to develop a *musica caelestis* in line with his epistemological framework. He begins traditionally enough, following Remigius of Auxerre in deriving *Camena* from *canere amoene*: 'The goddess Camena is so called because she sings beautifully in the heavenly harmony. For diversity and plurality produce every harmony of sounds. There is no harmony in identity.'[201] A quick consonantal shuffle suggests a second etymology: *'Camena' quasi 'canema,' id est canens anime.*[202] For

[197] *Guillelmi Glos. sup. Tim.* 108.11–13: Persequi uero hanc choream est ostendere quis eorum cum alio reddat uel diapente uel aliam consonantiam: quod hic praetermittit Plato.

[198] There are exceptions. The *Glosae Colonienses super Macrobium* (as discussed by Alison Peden, though she wrongly attributes the theory to William of Conches) explains how planets with equal velocity can move at different speeds by distinguishing between 'absolute and angular speed' (Peden, "Music in Medieval Commentaries on Macrobius," 156). See *Glos. Colonienses sup. Macr.*, comment. ad 2.1.3 (254.23–25): Nam quo sunt superiores, eo in circumvolvendo, celeriores; quo inferiores, eo segniores; et tamen eodem tempore omnes circumvolvuntur, ut patet in exteriore et interoire parte molendine. This argument was incorporated into the interpolated version of William's *Glosae super Macrobium*, Copenhagen, Det Kongelige Bibliotek, Gl. Kgl. Sammlung 1910 4°, f. 102r (whence Peden's ascription to William).

[199] See 2.7 (p. 71.

[200] *Comm. in Mart.* 3.76–84: CALLIOPEA optime vocis interpretatio est. Hec est autem armonia celestis, quam esse sic probant philosophi. Non possunt, ut aiunt, tanta corpora tam violento impetu silentio discurrere. Une necesse est quod incitatione eorum aer in sonum formetur. In calestibus nil expers moderamine. Quia ergo ibi est et sonus et concordia, est armonia. Set cur nostro se nequaquam auditui suggerat hec ratio? In omnibus sensibilibus modulo et mensura egent sensus humani. Visus enim, cum lucem intuetur, nimia luce fit hebes. Ergo et illius soni nimietatem capere noster ad hoc impar nequit auditus.

[201] *Comm. in Mart.* 3.261–263: Hec dea CAMENA dicitur quia amene canit in celi armonia. Diversitas et pluralitas sonorum armoniam omnem reddunt: nulla enim identitate armonia. Cf. Lutz, *Remigii Autissiodorensis Commentum in Martianum Capellam* 1:67. *Canens amoena* (or *amoene*) is a common etymology found in other twelfth-century commentaries, e.g., William of Conches, *Glos. sup. Boet.* 1.m1.41–42, and the anonymous Florentine commentary on Martianus (Florence, Bib. Naz., Conv. Soppr. I.1.28) discussed below.

[202] *Comm. in Mart.* 3.263–264.

this fanciful etymology, the commentator gives two rationales. The first explains *canens anime* as the performance of music when the soul separates from the body, a reference (presumably) to funereal practices. The second and more speculative explanation posits the heaven's twin motions as a celestial song. The full passage reads as follows:[203]

> Vel 'Camena' quasi 'canema,' id est canens anime. Dicitur enim quia animabus et aliis spiritibus in sua naturali regione cantus illos exhibet. Musicam enim credunt spiritibus gratam, unde in separatione anime a corpore tibias exercebant, quibus nostro tempore pulsus campanarum successit. Set melius quod anime in celestibus canit [canunt *Westra*] dum cursus planetarum et applanes iungat. Documentum enim in hoc habet anima cum videat in mundo meatum geminum: unum ab occidente in orientem, qui erraticus dicitur, quia ascendit et descendit; alium qui ab oriente in occidentem directus ad orientem refertur, qui rationabilis dicitur quia semper uniformis est. [. . .] Iterum anima videt in se quasi rationalem motum rationem, quasi erraticum sensualitatem; dumque nititur ratione sensualitatem cohibere, celestia imitatur. Diversitas itaque motus illos conferens anime canit, dum per eos omnia taliter instruit. Unde Plato deum inquit hominibus iccirco oculos dedisse, ut mentis et providentie circuitus qui fiunt in celo notantes, sue mentis motus erraticos corrigant.

Clear signposts (*dicitur* and the anonymous *credunt*) suggest that another source lurks behind this author's interpretation. That source, *ad sensum*, is likely Macrobius' *Commentarii in Somnium Scipionis*, 2.3.4–6 (104.18–105.5):[204]

[203] *Comm. in Mart.* 3.263–287: Or 'Camena', as if 'Canema,' is derived from *canens animae* (singing to the soul). For it is said that she reveals those songs to souls and other spirits in her natural region. For they believe that music is pleasing to spirits, whence at the separation of the soul from the body, they used to play *tibiae*; in our age, we have replaced this with the ringing of bells. But it is better that Camena sing to the soul in the heavens, when she joins together the courses of the planets and fixed stars. The soul has evidence of this, since it sees in the world a twin movement: one from the west to the east, which is called erratic because it ascends and descends; the other, which moves straight from the east to the west and then is carried back again to the east, is called rational because it is always uniform [. . .] Moreover, the soul sees in itself, like a rational motion, reason, and like an erratic motion, sensuality. When it struggles to suppress sensuality with reason, it imitates the heavens. Diversity, uniting these motions, sings to the soul, and in such a way teaches all things through these motions. Whence Plato says that God gave eyes to men for this reason, so that knowing the courses of the [divine] providence and mind that occur in the heavens, they might correct the erratic motions of their own mind. Cf. Calcidius, *In Tim.* 95 (148.9–10): Erit ergo animae aplanes ratio, planetes ut iracundia et cupiditas ceterique huius modi motus. St. Florian *In inst. mus.* 28: Unde etiam philosophi duos ei motus assignaverunt: motum planeticum et motus firmamenti. Motus autem planeticus est ab occidente in orientem, motus firmamenti ab oriente in occidentem; tumc autem anima dicitur motu ferri planetico, quando eligendo malum nititur pervenire ad suum causatorem, et non potest, quia semper detruditur in hac terrena, sicut planetae a firmamento referuntur in occidentem; tunc autem dicitur uti motu firmamenti, quando fugiendo malum eligit bonum, tunc enim redit ad suum principium.

[204] The Etruscans too understood that the Muses indicated the song of the world, for they called the Muses 'Camenae' from (by way of 'Canenae') 'canere' (to sing). For this reason, theologians too, since they approved the thesis that the heavens sing, used music during their sacrifices, which some performed with the lyre or cithara, others with the tibia or other instruments. In the hymns to the gods, too, the verses of the strophe and antistrophe used to be set to music, so that the strophe might represent the forward motion of the celestial sphere and the antistrophe the reverse motion of the planetary spheres; these two motions produced nature's first hymn in honor of the Supreme God. In funeral processions, too, the practices of diverse people have ordained that it was proper to have musical accompaniment, owing to the belief that souls after death return to the source of sweet music, that is, to the sky.

> Musas esse mundi cantum etiam Etrusci sciunt, qui eas Camenas quasi canenas a canendo dixerunt. Ideo canere caelum etiam theologi comprobantes sonos musicos sacrificiis adhibuerunt, qui apud alios lyra vel cithara, apud non nullos tibiis aliisve musicis instrumentis fieri solebant. In ipsis quoque hymnis deorum per stropham et antistropham metra canoris versibus adhibebantur ut per stropham rectus orbis stelliferi motus, per antistropham diversus vagarum regressus praedicaretur, ex quibus duobus motibus primus in natura hymnus dicandus deo sumpsit exordium. Mortuos quoque ad sepulturam prosequi oportere cum cantu, plurimarum gentium vel regionum instituta sanxerunt persuasione hac, qua post corpus animae ad originem dulcedinis musicae, id est ad caelum, redire credantur.

In this passage, which is occasioned by a similar etymological gloss, 'Camenas quasi canenas a canendo,' Bernard would have found all the building blocks for his etymological rationale: *tibiae* and other instruments, the musicalized *geminus motus* of the heavens, and funeral music as a fitting accompaniment to departing souls. Inspired, perhaps, by Macrobius' comment that the heavens' twin motions comprise the first hymn to God, Bernard explicitly appeal to the *geminus motus* as the sole astronomical ground for the harmony of the spheres: its concordant diversity sings to the soul (*diversitas illos motus conferens anime canit*).[205] Moreover, this interpretation allows the commentator to connect the celestial symphony to Plato's famous dictum at *Timaeus* 47c that God gave us eyes with which to learn from the celestial choreography. Hence, this gloss on Camena presents a remarkably synthetic view of celestial harmony: reading Martianus through a Boethian framework, Macrobius offered the commentator's rationale, and Plato provided his proof text. And this is not merely an ad hoc mélange; it is a strategic maneuver. By proceeding in this way, the author is able to align elegantly the celestial harmony with his own epistemological aim.

The Florentine commentary on Martianus, however, proceeds differently and glosses the *Camena* as follows:[206]

[205] That the *geminus motus* underlie the celestial harmony, cf. Bernard's other reference to the twin motions, under the heading of *mundana musica in astris* (3.429–434): Aura est impetus concitatus – quod intelligimus esse geminum illum orbicularem motum – in quam philosophi animam mundi scissam astruunt. Dicit enim Boetius, a Platone et in hoc eruditus, quia mundi anima 'cum secta, duos motum glomeravit in orbes.' Unde et hoc loco motus ille aura *mentis*, id est anime mundi, dictus est.

[206] *Exp. in Mart.* (Florence, Bib. Naz. Centrale, Conv. Soppr. I.1.28, f. 5ov): He [sc. Hymenaeus] is the son of Camena, i.e., the continuous concord of the elements or even the celestial harmony. Whence Camena is derived, as it were, from 'singing beautiful things.' For just as there are nine muses – for Camena is one made from eight of them – so too in the composition of the world there are nine sounds: one in fixed stars, seven in the planets, but the ninth on the earth. Eight of these, namely those of the fixed stars and the seven planets compose the celestial harmony, from whose benefit the whole body of the world is proportionally conserved. The commentator reiterates the point later in the commentary (6ov): Astrologi uero dicunt nouem musas nouem sonos, qui in celesti armonia notantur. Quorum septem in planetis septem constant, alii duo, unus in celesti spera quae aplanes dicitur, alter uero ex illis octo confectus, quem tota simul reddit armonia. Vel, ut alii dicunt, alter constituatur in terra ut accutissimus sonus sit in spera celesti, grauissimus sit in terra. Atque hoc rectius uidetur ut, sicut spere nouem, ita quaeque suum faciat sonum. = (with minor discrepencies) Westra, *The Berlin Commentary*, 185. On medieval adaptations of Muses to the (harmony of the) spheres,

> Filius [sc. Hymenaeus] Camenae est, id est iugabilis elementorum concordiae siue etiam caelestis armoniae. Vnde Camena dicitur quasi canens amena delectatione musicarum consonantiarum. Quemadmodum enim nouem sunt Musae (Camena est una ex octo earum facta), ita [est] in mundi compositione nouem sunt soni: unus in sphaera, septem in planetis, nonus autem in terra. Horum octo – scilicet sphaerae et septem planetarum – caelestem composuerunt concinentiam [*scripsi*, continentiam *F Dronke*], ex cuius beneficio omnia mundi corpora proportionaliter conseruantur.

The sticking point here, of course, is the placement of that awkward ninth muse. The commentator is undoubtedly under the sway of Martianus, as filtered, perhaps, through the lens of Remigius' commentary.[207] *De nuptiis* 1.27–28 paints a vivid picture of the nine muses riding beautiful swans, each in her respective sphere, but the last muse, Thalia, is saddled with a balking swan that refuses to fly, and thus remains earthbound.[208] Nonetheless, it is striking that the commentator enumerates *nine* distinct sounds and matches one of them to the earth, even if he qualifies the *caelestis concinentia* as arising from only eight of them. William of Conches knew better than to assign a pitch to the earth, and in his *Glosae super Macrobium* he follows (as we should expect) the Macrobian line, which had cast the ninth muse (Calliope) as the *concinentia quae confit ex omnibus* (2.3.1). William glosses the Muses' appearance in Macrobius' text as follows:[209]

> per octo Musas designauit octo consonantias effectas ex motu firmamenti et planetarum, per nonam Musam designauit consonantiam quae conficitur ex octo aliis. [...] Theologi uolebant sic esse in caelo nouem Musas: septem planetarum, octauam firmamenti, nonam maximam.

Here again, there is no mention of scales or notes, and no precise musical structure is brought to bear on the question. In William's last cosmological work, the *Dragmaticon*, the heavens fall silent; there is no mention of the music of the spheres, and the astronomy at work in the pages of the *Dragmaticon* is not the Platonic astronomy of William's *Glosae super Platonem* or the Macrobian

see Marie-Thérèse d'Alverny, "Les Muses et les sphères célestes," in *Classical, Mediaeval and Renaissance Studies in Honor of B.L. Ullman*, ed. Charles Henderson, 2 vols. (Rome: Edizioni di Storia e Letteratura, 1964), 2.7–19; on the Muses in the Berlin commentary in particular, see Tanja Kupke, "Où sont le muses d'antan? Notes for a Study of the Muses in the Middle Ages," in *From Athens to Chartres: Neoplatonism and Medieval Thought: Studies in Honour of Edouard Jeauneau*, ed. Haijo J. Westra (Leiden: Brill, 1992), 421–436.

[207] Lutz, *Remigii Autissiodorensis Commentum in Martianum Capellam* 101.34–102.2: novem ordines habere [sc. armonia caelestis] dinoscitur, scilicet propter septem planetas octavamque sphaeram caelstem atque ipsam terram quae totius consonantiae, informatis vocibus materiei, proportionem possidet. Cf. Honorius of Autun, *Imago mundi* 1.86: unde et philosophi viiii musas finxerunt quia a terra usque ad celum viiii consonantias deprehenderunt.

[208] *De nuptiis* 1.28 (13.8–10): sola vero, quod vector eius cycnus impatiens oneris atque etiam subvolandi alumna stagna petierat, Thalia derelicta in ipso florentis campi ubere residebat.

[209] *Glos. sup. Macr.*, comment. ad 2.3.1–2: By the eight Muses, he indicated the eight consonances made from the motion of the firmament and the planets; by the ninth Muse, he indicated the consonance that is produced from the eight others. [...] Theologians were wont to say that there were nine muses in the heavens: seven pertaining to the planets, the eighth pertaining to the firmament, and the ninth being the great sum [of them all].

astronomy of the *Glosae super Macrobium*. Rather, William turned instead to a work of Arabic cosmology, the *Liber de orbe* by Māshā'allāh (translated by Gerard of Cremona around the middle of the century), as Barbara Obrist has recently brought to light.[210] Although William does not accept Māshā'allāh's vigorous defense of the heavens' non-elemental constitution and 'upholds with Plato against Aristotle the traditional Western, early medieval position of a fiery heaven,'[211] William's cosmos began to shift away from the exclusively Macrobian and Capellan models at work in his earlier commentaries and treatises. Hisdosus, too, undercut several key points in the basic Platonic cosmos by arguing vociferously against the thesis that the planets move contrary to the firmament. Traditional arguments that the contrary motions could somehow temper or balance each other were brushed aside by Hisdosus: *Nos uero, Helperico et peripateticorum dogmati consentientes, dicimus ab ortu ad occasum ferri planetas*.[212]

This shift away from the Platonic cosmos, and away from its variously formulated astronomical harmonies, dramatically plays out in an anonymous commentary on book eight (astronomy) of Martianus' *De nuptiis* in BL, Cotton Vespesian A.II, ff. 75v–122v, which directly challenges the reality of the *musica caelestis* on both acoustical and astronomical grounds. The commentary, included in the seventh section of this composite manuscript – a collection of *membra disiecta* from the twelfth through fourteenth centuries – was copied in England around the early-thirteenth century, and the hand is similar to that of ff. 27–40 (the manuscript's fifth section), which also focuses solely on astronomy (containing two works on the astrolab by Rudolph of Bruges and Abraham ibn Ezra, and the latter's *Book of the Foundations of the Astronomical Tables* [incomplete]).[213] This Martianus commentary remains, to my knowledge, completely unstudied, and further work on late-twelfth- and early-thirteenth-century astronomy will doubtless contribute to our understanding of music's role (if any) in the swiftly changing cosmological thought during the early stages of the 'new Aristotelianism.' My remarks here focus solely on the extended gloss that follows upon the lemma, *Quo loco obliquitas solis, lunae ac siderum orbisque signiferi se circumducit* (*De nuptiis* 8.814 [309.10–11]). A discussion of

[210] Barbara Obrist, "William of Conches, Māshā'allā, and Twelfth-Century Cosmology," *Archives d'histoire doctrinale et littéraire du Moyen Âge* 76 (1999): 29–87.

[211] ibid., 32. See *Drag.* 3.5.

[212] Paris, BnF lat. 8624, 21v. Hisdosus' arguments are directed primarily against William of Conches.

[213] For a full description of the manuscript, see Marie-Thérèse d'Alverny, "Les 'Solutiones ad Chosroem' de Priscianus Lydus et Jean Scot," in *La transmission des textes philosophiques et scientifiques au Moyen Age*, ed. Charles Burnett (Aldershot: Variorum, 1994), 150–151. On the astronomical texts in ff. 27–40, see Charles Burnett, *The Introduction of Arabic Learning into England*, Panizzi Lectures (London: British Library, 1997), 50–58.

the various motions in the heavens[214] leads to the supposed consequence of such motions:[215]

> Aiunt enim quod quies et silentium circa idem subiectum indiuidue se comitantur. Motus uero et sonus proportionaliter in sua subiecta irrepunt. Vnde motus uelox et spissus, acumen, tardus et rarus grauitatem in uoce producit. Hanc autem proportionalitatem in inferioribus irrefragabiliter procedere conspiciunt. Vnde plerique coniectant quod cum sublimia proportionali sub uelocitate uelocissima sint, armoniam et acutissimam uociferationem intendunt. Vnde Boetius in musica: qui enim fieri potest, ut tam uelox celi machina tacito silentique cursu moueatur? Vnde et Cicero in sompnio Scipionis: Quis est qui complet aures meas tantus et tam dulcis sonus? Hinc plurimi persuasi profitentur materialem, consonantissimam, et perpetuam armoniam in sublimibus subsistere.

The commentator's language reveals his sympathies, which lie not with the proponents of celestial harmony but with its critics. He begins his summary of the proponents' rationale as follows: *Hanc etiam opinionem prosequentes et exaggerantes aiunt hanc existimationem non a sensu mortalium, sed a ratione philosophorum fuisse profectam.* The basic *ratio philosophorum* is simple: if there is motion in the heavens, then there must be sound.[216] The real burden of the proponents of the *musica caelestis* is to explain why we cannot hear it. The commentator lists the common arguments: we are deaf to the sound either because its intensity overwhelms the sense of hearing,[217] or because we do not know what it would sound like *not* to hear the sound, as we, in the terrestrial realm, are always already accustomed to it.[218] Unnamed *alii*, however, destroy this line of argument on acoustical grounds. Sounds, the reply goes, are proportional to the solidity of the objects that collide: collision of a solid body with air produces a minimal sound; collision with fire produces still less; and collision with the *quinta essentia* produces no sound at all, because the quintessence has absolutely no bodily mass

[214] 84v: Sciendum itaque quod motuum alius directus, alius obliqus. Item alius naturalis, alius accidentalis. Item alius rationalis, alius irrationalis.

[215] Cotton Vespesian A.II, 85ra: For they say that rest and silences indivisibly accompany each other within the same subject. Motion and sound, however, proportionally steal into their subjects. Whence, a swift and frequent motion produces highness in pitch (*in uoce*), whereas a slow and infrequent motion produces lowness in pitch. They, moreover, observe that this proportionality inviolably proceeds in the terrestrial realm. Whence many conjecture that since the heavens are extremely swift in their proportional speed, they extend a harmony and most high-pitched sounds (*uociferatio*). For as Boethius says in his *De musica*: How could it happen that such a swift heavenly machine be moved in a mute and silent course. And Cicero too in his *Dream of Scipio*: What is that great and sweet sound that fills my ears? Many, persuaded by this, declare that a material, consonant, and perpetual harmony exists in the heavens.

[216] Cotton Vespesian A.II, 85ra: Ratio autem haec est. Dicte siquidem armonie causam praedictam, scilicet motus uelocitatem et plurium motuum proportionalitatem, in sublimi praeiacere existimant. Et ob hoc ipsius causae effectum procedere non ambigendum esse decernunt.

[217] Cotton Vespesian A.II, 85rb: Vehemens namque sonoritatis intensio auditum disssipat et hebetat, sicut et nimius splendor uisum. Solem namque directe intuentibus eius radii aciem retundunt et dissipant.

[218] Cotton Vespesian A.II, 85rb: sicque accidit in cataduplis, in molendino, in ortu solis cotidiano.

or solidity.[219] There is thus no sound, and no music, in the heavenly quintessence.[220] We are now firmly in an Aristotelian cosmos, despite the fact that the very text upon which the commentator comments propounds the very view he is arguing against. Moreover, despite the clear Aristotelian slant to the text, there is no direct evidence that the commentator has read the *De caelo* (in Gerard of Cremona's translation) – for not only is there no appeal to the authority of Aristotle to refute and balance the 'Platonic' opinions of Boethius and Cicero cited at the outset of the discussion, but there are no verbal echoes of Gerard's *De caelo* that would necessitate (or even suggest) a first-hand familiarity with the text.[221] That the unnamed *alii* were in fact 'Aristotelians' reading and thinking about the *De caelo* seems probable. What is important, however, is that the gradual silencing of the Platonic cosmos occurred in dialogue with the very Platonic texts that had grounded and guaranteed the 'reality' of the *musica caelestis*, and the *musica mundana* generally, for nearly a millennium. The quest to understand the *machina mundi* led ultimately to the unraveling of the cosmic harmony that has been the subject of this study. Granted, the music of the spheres did not disappear altogether, but it changed it tune considerably[222] – so much so that it no longer would have been recognizable to the twelfth-century readers of Plato, Calcidius, Macrobius, Martianus, and Boethius. On this, much more could be said, but we should heed Macrobius' caution: *Non enim, si faciunt mentionem de musica, sunt omnia dicenda quae de ea dici possunt*.

[219] Cotton Vespesian A.II, 85rb: Alii ratiocinatione a radice exscisa super extractionem diruunt et dissipant. Dicunt igitur, ad assignatam causam recidendam, non unius corporis motum sine alicuius soliditatis occursu sonum grauare, ut in collisione malleoli et tintinnabuli. Vnde soni soliditati collisorum proportionantur. Inde est quod, corpore quantumlibet solido ad aera non nichil soliditatis habentem colliso, minimam sonoritatem educit, et deinceps in igne mini[mi]orem, in quinta denique essentia, totius corpulentie et soliditas immuni, nullam.

[220] Cotton Vespesian A.II, 85rb: Sicque motui sublimium sonum sonorumque consonantiam omnimodo denuntiant. Quo interempto tota sequens ratiocinatio dissoluitur.

[221] For an edition of Gerard of Cremona's translation of *De caelo* 2.9, see Paul Hossfeld, ed., *Alberti Magni De caelo et mundo*, Alberti Magni Opera omnia 5.1 (Münster: Aschendorff, 1971), 162–165 (primus apparatus).

[222] See, for instance, Cecilia Panti, "Robert Grosseteste's Theory of Sound," in *Musik- und die Geschichte der Philosophie und Naturwissenschaften im Mittelalter: Fragen zur Wechselwirkung von "musica" und "philosophia" im Mittelalter*, ed. Frank Hentschel, Studien und Texte zur Geistesgeschichte des Mittelalters (Leiden: Brill, 1998), 3–18; Rico, "Music in the Arts Faculty of Paris in Thirteenth and Early Fourteenth Centuries"; Gilles Rico, "*Auctoritas cereum habet nasum*: Boethius, Aristotle, and the Music of the Spheres in the Thirteenth and Early Fourteenth Centuries," in *Citation and Authority in Medieval and Renaissance Musical Culture: Learning from the Learned*, ed. Suzannah Clark and Elizabeth Eva Leach, Studies in Medieval and Renaissance Music 4 (Woodbridge: Boydell, 2005), 20–28; Gabriela Ilnitchi, "*Musica mundana*, Aristotelian Natural Philosophy and Ptolemaic Astronomy," *Early Music History* 21 (2002): 37–74.

5.6 Appendix I: Hisdosus, *De anima mundi in Timaeum Platonis*: *Quid sit anima mundi.*

| 17v | Ille itaque uersus platonicus nobis glosandus occurrit, quo dicitur deus animam mundi in medietate locasse. Vbi haec mihi peruestiganda uidentur: quid sit mundi anima, quid medietas, quid sit deum animam mundi in eius medietate locasse.

Anima igitur mundi est ille creatoris amor aeternus quo cuncta creauit et creata concorditer regit ea concordia quae, si deficiat, statim mundi machinam dissoluat. Hunc amorem christianae religionis regulam sectantes theologi spiritum sanctum appellauerunt, ut quidam dicere uoluit, de homine ad deum uerba transferentes. Quemadmodum enim, inquit, in flatu hominis eius mens cognoscitur, utrum laetitia scilicet diffundatur an maerore angatur, ita per huius amoris uisionem peruenitur ad mentis diuinae cognitionem. Quod autem in flatu hominis et facie aut laetitia deprehendatur aut tristitia, non diffitetur Iuuenalis dicens,

> Deprehendas animi tormenta latentis in aegro
> corpore deprehendas et gaudia, sumit utrumque
> hunc habitum facies.

Sanctum uero appellauerunt illum spiritum antonomasice, id est excellenter. Ipse enim sanctorum sanctissimus est quippe qui sanctitatem ex se habens sui participatione ceteros cunctos bonos efficit. Alii denique amorem illum asserunt spiritum sanctum appellatum quia sancte spirat, id est procedit a patre et a filio. Iste enim spiritus est tertia trinitatis persona. Neque enim si pater est spiritus et sanctus, idcirco est spiritus sanctus. Similiter et de filio dicimus. Non enim quaecumque disiunctim praedicantur et coniunctim. Quare autem pater potentia, filius sapientia nuncupetur, suo

1/2 *Tim.* 34b 5/7 Vide infra, 221.20–24 (cum notis). 7/9 GVILLELMVS DE CONCHIS, *Philosophia*, I, 9; PL 172, 45C; ed. G. Maurach, I, 10, p. 21: "Est autem proprie spiritus halitus, sed quia in spiritu et anhelitu saepe hominis uoluntas perpenditur (aliter anima spirat laetus, aliter iratus) …" 11/13 IVVENALIS, *Satira*, IX, 18–20; cf. (PS.-)BERNARDVS SILVESTRIS, *Commentum super sex libros Aeneidos Virgilii*, ed. J.W. et E.F. Jones, p. 96, 15–17; GVILLELMVS DE CONCHIS, *Glosae super Boetium*, I, prosa 1, 82–87; CCCM 158, p. 21. 14 GVILLELMVS DE CONCHIS, *Philosophia*, I, 9; PL 172, 45C; ed. G. Maurach, I, 10, p. 21: "…diuinam uoluntatem translatiue uocauerunt spiritum, sed antonomasice sanctum." 19/20 Cf. GVILLELMVS DE CONCHIS, *Philosophia*, I, 5–9; PL 172, 44D–45C; ed. G. Maurach, I, 8–10, pp. 20–21; sed contra, ID., *Dragmaticon*, I, 9; CCCM 152, p. 8

10 diffitetur *con. E. Jeaun.*, diffutetur *P* 12 sumit *scripsi*, summit *P* 19 disiunctim *P*, disiuncti *T. Greg.* || coniunctim *P*, coniuncti *T. Greg.*

loco plenius exponetur. Alii denique diffiniunt animam mundi dicentes, mundi anima est uigor naturalis rebus insitus, quo quaedam tantum discernunt, ut angeli et spiritus alii. Aliae discernunt et sentiunt, ut rationalis natura humana. Aliae sentiunt sed non discernunt, ut bruta animalia. Aliae crescunt nec sentiunt, ut herbae et arbores quorum uita est uigor non anima. Aliae sunt nec crescunt, ut lapides. Ille naturalis uigor spiritus sanctus ab eisdem doctoribus dicitur. Haec sententia in nullo a priore discordat. Etsi uerba sint diuersa, idem est tamen sensus per omnia.

Quod mihi uidetur de mundi anima simpliciter pando, non omnibus aliorum sententiis praeiudicans. Quorum quidam dixerunt Platonem uoluisse mundum esse quoddam magnum animal, cuius animam dixerunt esse uitalem calorem a sole procedentem, qui per omnes mundi partes diffusus ipsum mundum uegetat. Alii dixerunt deum iecisse mundum istum quasi fundamentum et principium omnium substantiarum, id est corporum et spirituum. Aiunt enim ex corpore mundi cuncta alia corpora fieri. Porro mundi animam ponunt quasi fontem quendam ceterarum animarum, quam uolunt esse quendam magnum spiritum per totum mundum diffusum, non audentes hunc dicere spiritum sanctum spiritum esse. Aliquantillum isti ueritati accedunt, sed nundum eam perfecte intuentur, suae ignorantiae culpam retorquentes in Platonem et Virgilium in philosophico more de anima mundi loquentes. Quomodo enim potuit manifestius expedire Virgilius quid mundi animam diceret, quam cum dixit,

20/24 GVILLELMVS DE CONCHIS, *Glosae super Boetium*, III, metr. 9, 522–531; CCCM 158, pp. 169–170: "Anima mundi est naturalis uigor quo quaedam res tantum habent moueri, quaedam crescere, quaedam sentire, quaedam discernere. Sed quid sit ille uigor naturalis quaeritur. Sed ut michi uidetur ille naturalis uigor est spiritus sanctus"; ID., *Philosophia*, I, 15; PL 172 46D; ed. G. Maurach, I, 13: "Alii dicunt animam mundi esse naturalem uigorem rebus insitum, quo quaedam uiuunt tantum, quaedam uiuunt et sentiunt, quaedam et sentiunt et discernunt." Vide T. Gregory, *Anima mundi*, p. 133ff. 27/29 Vide infra, 224.98–101 (cum notis). Cf. AVGVSTINVS, *Sermo* CCXLI: *In diebus Paschalibus, XII. De Resurrectione corporum, contra Gentiles.*, cap. 7; PL 38, 1137: "Sed nolo hinc diutius disputare, libros uestros lego: mundum istum animal dicitis, id est, coelum, terram, maria, omnia quae sunt ingentia corpora, immensa usquequaque elementa; totum hoc, uniuersumque corpus, quod ex his elementis omnibus constat, dicitis esse animal magnum, id est, habere animam suam, [...] quasi animam uniuersalem mundum regentem, et unum quoddam animal facientem." 29/32 BERNARDVS SILVESTRIS, *Commentum in Martianum Capellam*, 8, 991–994; ed. H.J. Westra, p. 205: "De anima mundi ueters sensere philosophi quod, sicut mundanum corpus magnum est a quo omnia corpora prodeunt et in quod reducuntur, ita eius anima magnus quidam spiritus est a quo omnes animae ortum et in quem regressum habent." MACROBIVS, *Commentarii in somnium Scipionis*, I, 6, 20; ed. J. Willis, p. 22, 5: "aut mundi anima quae animarum omnium fons est."

22 sentiunt *con. T. Greg.*, dissentiunt *P* 23 uigor *scripsi*, uiror *P* 25 idem P^c, deest *P* 28 procedentem P^c, procedente *P* 34 retorquentes *con. T. Greg.*, retorquentis *P* || Virgilium *con. T. Greg.*, Virgilio *P* 34/35 loquentes *con. T. Greg.*, loquentis *P* 35 quam *scripsi*, quod *P*

'Principio caelum et terram camposque liquentes
lucentemque globum lunae Tytaniaque astra
spiritus intus alit, totosque infusa per artus
mens molem agitat et magno se corpore miscet.
Inde hominum pecudumque genus uitaeque uolantum
et quae marmoreo fert monstra sub aequore pontus'?

His uerbis manifestissime mundi animam spiritum Virgilius, ueritatis non inscius, nuncupauit. Vnde isti suam sententiam trahunt. Post haec nimirum inquit, 'Inde hominum pecudumque genus uitaeque uolantum', quibus uersibus Virgilius intelligi uoluit spiritum sanctum, id est bonitatem diuinam, causam esse quare cuncta quae in mundo uita decorantur, anima uegetantur. Iste ⟨spiritus⟩ sanctus, quo omnia uegetari ait Virgilius, mundi anima a quibusdam philosophis est appellatus ea ratione, quod eo spiritu, id est creatoris bonitate, cuncta facta sunt. Quod uoluit dicere Lucanus in hoc uersu,

Iupiter est quocumque uides quocumque moueris.

Et Virgilius hoc alio,

A Ioue principium Musae, Iouis omnia plena.

Quod sola bonitate conditoris omnia facta sint, sic potest probari. Omnes causae quibus aliquid fit hae fere sunt: indigentia, coactionis necessitas, casus, benignitas. Creator igitur sibi usquequaque sufficiens nullo indigebat. Cogi uero ut contra uoluntatem quid faceret, quomodo potens omnia posset? Sed si casu mundus esset factus, aliquae causae mundum praecessissent, quarum concursus mundum operatus fuisset. Item si casu deus mundum fecisset, deo ignorante mundus prouenisset. Casus enim est inopinatus euentus rerum ex causis confluentibus sine intentione gerentium. Sola ergo conditoris bonitas fabricauit mundum et illius ornatum. Vnde ait Boetius,

37/42 VIRGILIVS, *Aeneis*, VI, 724–729. Cf. BERNARDVS SILVESTRIS, *Commentum in Martianum Capellam*, 8, 1008–1025; ed. H.J. Westra, p. 206; MACROBIVS, *Commentarii in somnium Scipionis*, I, 14, 14, etc. 50 LVCANVS, *De bello ciuili*, IX, 580 52 VIRGILIVS, *Eclogues*, III, 60. Cf. MACROBIVS, *Commentarii in somnium Scipionis*,I, 17, 14; ed. J. Willis, p. 69, 14. 56/58 GVILLELMVS DE CONCHIS, *Philosophia*, I, 5; PL 172 44B; ed. G. Maurach, I, 6, p. 19: "Si operatus esset casus mundum, aliquae causea praecessissent mundum, quarum concursus operaretur illum. Est enim casus inopinatus euentus ex causis confluentibus." Cf. BOETHIVS, *Consolatio philosophiae*, V, I.

40 agitat P^c, agat P 41 uiteque *sup. lin.* P^c, interque P 45 uitaeque *scripsi*, .i.t.q. P 46 spiritus *ego suppl.* 47 quo *scripsi*, quae P 50 quocumque … quocumque P^c, quodcumque … quodcumque P 55 quomodo *con. T. Greg.*, qualem P 59 bonitas *add. sup. lin.* P^c

Quem non externae pepulerunt fingere causae
materiae fluitantis opus uerum insita summi
forma boni liuore carens.

Sunt qui animam mundi dicant esse quendam motum rebus a creatore insitum. Sed non intelligunt nec quid uelint dicere auditoribus intimare queunt. Fortasse aliquis quaeret: cum anima mundi sit spiritus sanctus, sit ubique, estne anima mundi ubique? Quod si ubique est anima mundi, ergo in Socrate est anima mundi. Si igitur in Socrate mundi anima est, et Socratis est alia anima, ergo duae animae sunt in Socrate. Huic respondemus uerum esse mundi animam esse in Socrate et Socratis animam in eodem. Non tamen duae sunt in Socrate. Non enim est aliud animam mundi esse in Socrate quam Socratem habere hoc ex diuina bonitate quod ipse animatus est anima propria. Non ergo sequitur: si dei benignitas Socrati animam contulit, igitur duae animae sunt in Socrate.

Item subiciet aliquis: si anima mundi est spiritus sanctus, et spiritus sanctus est ab aeterno quicquid ipse est, ergo anima mundi ab aeterno est quicquid ipsa est. Et si mundi anima ab aeterno est quicquid ipsa est, igitur mundi anima ab aeterno est mundi anima. Quod si mundi anima ab aeterno est mundi anima, igitur ab aeterno mundus est ea animatus. Sed si mundus ab aeterno est animatus, tunc mundus est ab aeterno. Nos uero hoc argumentum falsum esse dicimus: si anima mundi uel spiritus sanctus est ab aeterno quicquid est uel anima mundi uel spiritus sanctus, ergo uel spiritus sanctus uel anima mundi ab aeterno est anima mundi. | 17v | Quomodo non sequitur: si hic pater est quicquid ipse est antequam habuisset filium, ergo hic pater est antequam habuisset filium; sic non sequitur argumentatio. Quemadmodum enim pater est nomen habitudinis, sic hoc uocabulum datum ex officio. Et quemadmodum hic praeceptor uel presbiter a pueritia sua ⟨est⟩ quicquid ipse est, non tamen hic praeceptor a pueritia sua est praeceptor, nec hic presbiter a pueritia est presbiter; sic fateor quod spiritus sanctus ab aeterno ⟨est⟩ quicquid ipse est, non tamen ille spiritus est ab aeterno mundi anima. 'Praeceptor' namque ex officio attribuitur. Et quomodo praeceptor dicitur aliquis eo quod praestet tortis uel etiam torquentibus, ita spiritus sanctus, id est dei bonitas, dicitur mundi anima ea ratione, quod conditoris bonitas cuncta quae in mundo uiuunt animat. Denique hoc uocabulum

60/62 BOETHIVS, *Consolatio philosophiae*, III, metr. 9, 4–6 65/67 ABAELARDVS, *Dialectia* I; ed. de Rijk, p. 559. GVILLELMVS DE CONCHIS, *Glosae super Boetium*, III, metr. 9, 545–546; CCCM 158, p. 170. ID. *Philosophia* I, 15; PL 172, 46–47; ed. G. Maurach, I, 13, p. 23. 75/87 Cf. ABAELARDVS, *Theologia 'Summi boni'* 3.94–99; ID., *Theologia Christiana* 4.145–147; ID., *Theologia 'Scholarium'* 2.174–176.

74 est *p. corr.*, sed *a. corr. P* 80 est *ego suppl.* 82 est *ego suppl.*

'quicquid' essentiam denotat. Sed hoc nomen 'praeceptor' uel 'anima', officium, quomodo 'pater', habitudinem. Quamobrem superius argumentum optime falsificatum est.

Dicto quid sit mundi anima, quid sit illius medietas incipiamus. Mundi ergo medietas illius communis participatio ⟨est⟩, medium autem solet dici commune. Mundi itaque animam in mundi medietate positam nichil aliud est quam uniuersitatem creaturam communiter diuina bonitate par- 90
ticipare. Mundus enim dicitur omnium creaturarum collectio, et a parte designatur totum. Mundus namque dicitur superius elementum proprie ideo quod omnia ibi sint munda, pura, nitida, splendida. Dicitur etiam mundus iuxta illud Apostoli, mors intrauit in mundum per feminam, id est in uniuersum genus humanum. Vel aliter medietas dicitur proportionalitas, unde etiam dicitur in arismeticis quod alia medietas est arismetica, alia geometrica, alia armonica. In proportionalitate igitur locata est 95
anima mundi, id est diuina bonitas ⟨ea⟩ quae in mundo sunt proportionaliter et concorditer creat et creata gubernat.

Alii autem dicunt quod mundi medietas est sol, quem cor totius mundi esse uolunt. Quemadmodum enim, inquiunt, anima hominis sedem et domicilium in corde habet, unde per membra corporis uires suas spargens in omnibus corporis membris tota sua membra uegetat, ita uitalis calor 100
a sole procedens omnibus quae uiuunt uitam subministrat. Cui sententiae Heraclitus adquiescens

89 GVILLELMVS DE CONCHIS, *Glosae super Platonem*, LXXI, 22; CCCM 203, p. 67: "Medium enim saepe pro communi accipitur." Cf. AVGVSTINVS, *Enarrationes in psalmos*, Ps. 103, Sermo II, xi, 12–13; CCSL 40, p. 1497. ALANVS DE INSVLIS, *Distinctiones dictionum theologicalium*, PL 210, 853C: "Medium sumitur pro communi." MANEGOLDVS LAVTENBACHENSIS, *In psalmorum librum*, Ps. 73; PL 93, 880D: "Medium enim accipitur pro communi." 91 GVILLELMVS DE CONCHIS, *Glosae super Platonem*, XXXVI, 3; CCCM 203, p. 37. ID. *Glosae super Boetium*, II, metr. 8, 13 et III, metr. 8, 26–27; CCCM 158, pp. 125, 145. ID., *Glosae super Macrobium*, I, 8, 4: "Vt ait Apuleius, mundus est elementorum collectio cum ornatu eorumdem; et bene dicit 'ornatu', quia aliter esset confusio." *Ibid*, I, xiv, 2: "*Vniuersum* quia uniuersa comprehendit: est enim ordinata collectio omnium creaturarum." Cf. APVLEIVS, *De mundo*, cap. 1 (initio); ed P. Thomas, Leipzig, 1921, p. 137, 7–8; ed. J. Beaujeu, Paris, 1973, p. 122: "Mundus est ornata ordinatio, dei munere, deorum recta custodia." 91/92 CALCIDIVS, *Commentarius*, cap. 98; ed. J.H. Waszink, p. 151, 3:"Caelum quoque usurpantes mundum omnem uocamus." MACROBIVS, *Commentarii in Somnium Scipionis*, II, 11, 12; ed. J. Willis, p. 129, 24–25: "Mundus proprie caelum uocatur." 93/94 Cf. Rom. 5, 12 98/101 MACROBIVS, *Commentarii in somnium Scipionis*, I, 20, 6–7; ed. J. Willis, p. 79. CALCIDIVS, *Commentarius*, cap. 100; ed. J.H. Waszink, pp. 151–152. GVILLELMVS DE CONCHIS, *Glosae super Boetium*, III, metr. 9, 569–573; CCCM 158, p. 171. REMIGIVS AVTISSIODORENSIS, *In Boethii Consolationem*, ed. E.T. Silk, *Saeculi noni auctoris in Boetii Consolationem Philosophiae commentarius*, Romae, 1935, pp. 335–336. ANONYMVS, *Explanatiuncula in uersus 'O qui perpetua' Boetii*, 6 et 9; ed. E. Jeauneau, *Lectio philosophorum*, pp. 324, 329. ANONYMVS, *In Timaeum Platonis*, ed. T. Schmid, *Classica et mediaeualia. Revue danoise de philologie et d'histoire*, 10, 2 (1949), p. 243. Vide supra, 221.27–29 101/105 CALCIDIVS, *Commentarius*, cap. 220; ed. J.H. Waszink, p. 233, 19–22. Diels-Kranz, *Die Fragmente der Vorsokratiker*, vol. I, Heraclitus, fr. 67a, p. 166; S.N. Mouraviev, *Heraclite D'Ephese. La tradition antique et medieval*, Academia Verlag, Sankt Augustin, 1999, no. 238, T1209, p. 892. Cf. M. Markovich, *Heraclitus. Greek Text with a Short Commentary*, Venezuela, 1967: "As I already suggested in *Phronesis*, 11 (1966), 26 f., there is nothing from Heraclitus in the fragment ..."

89 est *ego suppl.* 90 communiter *add. sup. lin. P*^{c}, coiunt *P* 96 ea *ego suppl.* 101 Heraclitus *scripsi*, eraclitus *P*

optimam similitudinem dat de aranea ad animam, de tela araneae ad corpus. Sicut aranea, ait, stans in medio telae sentit quam cito musca aliquem filum suum corrumpit, itaque illuc celeriter currit, quasi de fili persectione dolens, sic hominis anima aliqua parte corporis laesa, illuc festine meat, quasi impatiens laesionis corporis, cui firme et proportionaliter iuncta est. Cum itaque mundi anima sit dei benignitas, medietas uero mundi proportionalitas seu communitas, non est aliud deum animam locasse in medietate quam creatorem sua bonitate cuncta quae in mundo uiuunt proportionaliter et concorditer animare.

5.7 Appendix II: Hisdosus, *De anima mundi in Timaeum Platonis*: *Qualiter animam mundi divisit*.

| 19r | DIVISIONEM INSTAVRANS HACTENVS, id est hoc modo uel usque ad summam hanc dixerat deum animam diuidisse per partes. Hic autem ostendit qualiter eam diuisit. Et est in hoc loco tertium integumentum, quod, ut euidentissime aperiatur, haec a nobis discutienda sunt: qualiter per numeros anima diuisa dicatur, qualiter per septem et per hos septem, qualiter unitatem in principio posuit, qualiter pares et impares ab utroque latere diffluentes, qualiter a pari et impari lineares numeros apposuit et superficiales ⟨et solidos⟩, qualiter partitionem suam in solidos terminauit. Vnumquodque horum septem eo ordine quo annumerata sunt expedire temptemus.

Plato igitur uolens ostendere quod mundi anima, id est conditoris bonitas inenarrabilis, cuncta proportionaliter mouerit, dixit per numeros eam diuisam esse. In numeris enim solis aut in rebus eis subnectis proportio reperitur. Secundum numeros anima diuisa dicitur ut asseratur animae dignitas et potentiarum quas in rebus exercet. Numeri enim principio, id est unitate, nichil dignius est nec perfectius. Creator namque est ipsa unitas principalis. Denique nec numero illo aliqua creatura est excellentior. Numerus enim fuit exemplar in mente diuina. Vnde dictum est ad deum, 'Omnia fecisti in numero et pondere et mensura'. Iure igitur Plato perfectionem et excellentiam uolens denotare uel asserere | 19v | ait creatorem eam per numeros diuisisse.

7 Vnumquodque horum septem: id est, septem quaestiones, non septem numeri (et nota quod 'qualiter per septem et per hos septem' continet duo quaestiones 13 BOETHIVS, *De institutione arithmetica*, I, 1: Haec (*sc.* arithmetica) enim cunctis prior est, non modo quod hanc ille huius mundanae molis conditor deus primam suae habuit ratiocinationis exemplar et ad hanc cuncta constituit, quaecumque fabricante ratione per numeros adsignati ordinis invenere concordiam, . . . " 13/14 Sap. 11, 12

107 medietate *scripsi*, medietatem *P* 1 instaurans *scripsi cum Calcidio*, in statv *P* 3 integumentum P^c, *illeg*. *P* 6 et solidos *ego suppl.* || *post* in solidos *add*. et solidos *P* 11 numeri *scripsi*, numerum *P*

Partitionem uero istam usque ⟨ad⟩ septenarium numerum curauit Plato extendere ut per hoc innueret mundi animam spiritibus et corporibus essendi causam praebuisse. Ad spiritus enim ternarius, ad corpora uero refertur quaternarius, qui partes per aggregationem sunt septenarii. Sed septem sunt numeri a Platone in sectione appositi ut demonstraretur anima inuiolata esse et a nullo generata. Septenarius enim infra primum limitem, id est decadem, nec gignit quemquam numerum nec gignitur a quoquam. Vnde a mathematicis, ut testatur Macrobius, uirgo appellatus est.

Aut propter aliud dici potest quod anima septies diuisa est, propter hoc scilicet ut ea ostenderetur perfecte omnia uiuificare. Nam cum sint septem partes, sex esse ibi interualla necesse est, sed senarius perfectus est numerus. Non enim partes illius aggregatae aut ipsum excedunt aut infra subsistunt. Omnis nimirum ille numerus perfectus esse dicitur cuius partes ei aequantur, superfluus uero cuius partes exsuperant, ut duodecim; imminutus autem cuius partes infra reperiuntur, ut octonarius. Qui haec plenius scire desiderat Arismeticam legat studiosissime ueterum lectioni utilissimam.

Verumtamen quomodo senarii partes ei aequantur incipiamus, illo praemisso quod partes in hoc loco per multiplicationem, non per aggregationem accipiendae sunt—porro numeri multiplicatio est unius numeri per alterum dimensio, aggregatio uero diuersorum nuermorum coniunctio. Sunt itaque senarii hae partes: ternarius qui est media pars, binarius qui est tertia pars, unitas quae est sexta pars. Sed tria et duo et unum sex reddit, nec exuberantes nec infra subsistentes. Septem ergo sunt partes ut per sex earum intercapedines perfectio inesse animae designaretur.

Expedito cur anima a Platone per numeros diuisa dicatur et cur per septem, qualiter per hos septem aperiamus, prius oculis subiecta descriptione—ut in Platonibus solet ad euidentiam fieri—ut

17/18 Cf. HVGO DE SANCTO VICTORE, *De scripturis et scriptoribus sacris praenotatiunculae*, XV (*De numeris mysticis sacrae Scripturae*); PL 125, 22D: "Secundum multiplicationem numeri significant, ut duodenarius uniuersitatis signum est, quia ex ternario et quaternario inuicem multiplicatis perficitur; quoniam quaternarius corporalium, ternarius spiritualium forma est." 20/21 Cf. CALCIDIVS, *Commentarius*, cap. 36; ed. J.H. Waszink, p. 85. 21 MACROBIVS, *Commentarii in somnium Scipionis*, I, 6, 11; ed. J. Willis, p. 20, 15–22. Cf. CALCIDIVS, *Commentarius*, 36; ed. J.H. Waszink, p. 85, 14–18; MARTIANVS CAPELLA, *De nuptiis*, 7.738; ed. J. Willis, p. 267, 3–6; BERNARDVS CARNOTENSIS, *Glosae super Platonem*, 5, 136–139; ed. P.E. Dutton,p. 178. 23/24 CALCIDIVS, *Commentarius*, cap 38; ed. J.H. Waszink, p. 87, 15ff. MACROBIVS, *Commentarii in Somnium Scipionis*, I, 6, 12; ed. J. Willis, p. 20, 22–30. MARTIANVS CAPELLA, *De nuptiis*, VII, 736; ed. J. Willis, p. 265. BOETHIVS, *De institutione arithmetica*, I, xix, 43–51; CCSL 94A, p. 50. 24/26 GVILLELMVS DE CONCHIS, *Glosae super Macrobium*, I, 6, 12: "Superfluus dicitur numerus, cuius partes aggregatae reddunt maiorem summam ipso toto, sicut XII ... Diminutus est ille, cuius partes aggregatae minorem summam reddunt ipso toto, ut VIII. 30/32 MACROBIVS, *Commentarii in somnium Scipionis*, I, 6, 12. CALCIDIVS, *Commentarius*, cap. 38; ed. J.H. Waszink, p. 87, 17–19.

16 ad *ego suppl.* 25 cuius *add. sup. lin.* P^c 27 arismeticam P^c, arimeticam *P* 29 multiplicationem *scripsi*, multitudinem *P* || accipiendae P^c, accepiendae *P* 31 hae *scripsi*, heae *P* 34 septem *scripsi*, VI *P* 35 septem *scripsi*, VI *P*

per eam quaedam quae iam dicta sunt et pluraque quae dicturi sumus tam oculis subiecta fidelibus quam per aurem demissa intelligantur.

Per hos itaque numeros animae separatio facta est ut quod anima mundi secundum musicas consonantias proportionaliter cuncta moueat ostenderetur. Namque inter hos numeros sunt illae proportiones quae musicas consonantias resonant. Musicae autem consonantiae sunt quinque: diatessaron, diapente, diapason, ⟨diapason⟩ cai diapente, disdiapason. Tonus namque non est consonantia sed consonantiarum principium, cuius tamen effecta proportio inter hos numeros inueniri potest. Quomodo igitur in his numeris proportiones, quae musicas consonantias generant, inueniri queant, uideamus. Inter III itaque et IIII est epitrita proportio quae diatessaron facit. Sed ternarius ad duo hemiolia, id est ad sexqualteram proportionem, iungitur, haec diapente consonantiam resonat. Dupla uero proportione se habet ad binarium quaternarius uel ad eundem octonarius, haec autem proportio diapason generat. Nouenarius autem ternario et idem unitati tripla proportione copulatur, quae proportio parit diapason cai diapente. Denique inter octonarium et binarium uel quaternarium et unitatem est quadrupla proportio quae disdiapason efficit. Sed octonarius nouenario epogdoa proportione copulatur, ex qua tonus nascitur, qui tamen est principium consonantiarum non consonantia.

Sed quoniam non omnes qui hoc opusculum legerint aut arismeticam nouerint aut cordetenus supradictarum proportionum dissertationes retinuerint, eas com⟨m⟩ode expediamus. Est igitur epitrita proportio, id est sexquitertia, quotiens numerus ad numerum comparatus continet eum totum et eius tertiam partem, ut quaternarius ad ternarium. Hemiolia uero cum numerus aliquis eum totum et eius mediam partem possidet. Dupla autem cum numerus alium bis infra se continet. Sed tripla cum unus in alio ter continetur, ut III : IX. Quadrupla uero cum numerus metitur alium quater, ut IIII : ⟨XVI⟩. Epogdoa, id est sexquioctaua, quotiens unus numerus continet alium et eius octauam partem, ut IX : VIII.

40/41 MACROBIVS, *Commentarii in somnium Scipionis*, II, i, 24. 42/50 BOETHIVS, *De institutione musica*, I, vii et xvi; ed. G. Friedlein, p. 194 et pp. 201–203. ID., *De institutione arithmetica*, I, i; CCSL 94A, p. 13, 100–113. MACROBIVS, *Commentarii in somnium Scipionis*, I, 6, 43–44 et II, i, 14–20; ed. J. Willis, p. 26 et pp. 97–99. CALCIDIVS, *Commentarius*, cap. 35 et 46; ed. J.H. Waszink, p. 85 et pp. 95–96. 52/58 MACROBIVS, *Commentarii in somnium Scipionis*, II, 1, 15–20; ed. J. Willis, pp. 97–98. Cf. BOETHIVS, *De institutione arithmetica*, I, xxiiii–xxvii; CCSL 94A, pp. 60–67. ID., *De institutione musica*, I, iv; ed. G. Friedlein, pp. 191–192.

37 demissa intelligantur *tr.* 41 diapason cai diapente *scripsi*, c diapente *P*, cai diapente P^c || disdiapason P^c, diapason *P* 47 autem *scripsi*, aut *P* || ternario *scripsi*, ternarius *P* 49 dis- *add. sup. lin. P* 54 hemiola P^c, hemolia *P* 57 xvi *ego suppl.* 58 IX *p. corr.*, X *a. corr. P*

Reserato qualiter per numeros, qualiter per septem, qualiter per hos septem anima diuisa dicatur, qualiter primitus sumpta sit unitas enodemus. Est ergo et primo sumpta et in summo posita unitas, ut manifeste innueretur unum esse primum et summum principium omnium, a quo cuncta procedunt, tam corpora quam spiritus, tam mutabilia quam immutabilia, quod designant pares et impares ab utroque diffluentes. Pares ad corpora et mutabilia, impares autem ad spiritus et immutabilia referuntur.

Aliter dicunt quidam unitatem esse sumptam in principio et postea pares et impares ut ostenderetur anima easdem potentias exercere in pueritia, et omnem callem uitae usque ad annos discretionis simplici uia carpere. Tum uero quosdam bonae operationi insistere et desiderio aeternorum exaestuare, quod per impares manifeste designatur, alios autem mentis intentionem ad praua deflectere et temporalium et labentium cupiditate insatiabili feruere, quod per pares numeros intelligitur. Quae omnia uolens significare Pythagoras dixit in modum huius graecae litterae ϒ uitam humanam esse dispositam. Illa enim sic scribenda est ut ab uno illius pede duo rami prodeant. Alter quorum ad sinistrum uergens, ubi quasi a trunco exit, deorsumque tendens significat caduca appetentes et cum eis a quibus nec retineri uel quae retinere poterunt labentes. Alter uero ad dexteram surgens in principio strictus et in fine latus designat caelestis patriae proceres contemplationi caelestium collo inreflexo uacantes, ad uirtutum ardua indefesse contendentes, ut de uirtute in uirtutem gradientes deum deorum in Sion uidere mereantur. Ad dext⟨e⟩rum consurgere ramum nec in sinistrum deflectere ostenditur Cornutus a Persio cum ad eum dicens, loquitur,

Et tibi quae Samios deduxit littera ramos
Surgentem dextro monstrauit limite callem.

Qui hanc secundam sententiam asserere conatur in errorem mihi relabi uidetur. Non enim hic de humana anima Plato tractat sed de mundana quam alicuius sorde uitii maculari nefas est dicere.

Quoniam dictum est qualiter animae sectio per numeros facta sit, qualiter per septem, qualiter per hos septem, qualiter unitas prima sumpta sit, qualiter post eam pares et impares ab eadem defluentes,

75/76 Ps 83, 8 78/79 PERSIVS, *Satura*, III, 56–57. Cf. ISIDORVS, *Etymologiae*, I, iii, 6: "…litteram Pythagoras Samius ad exemplum uitae humanae primus formauit; cuius uirgula subterior primam aetatem significat, incertam quippe et quae adhuc se nec uitiis nec uirtutibus dedit. Biuium autem, quod superest, ab adolescentia incipit: cuius dextra pars ardua est, sed ad beatam uitam tendens: sinistra facilior, sed ad labem interitumque deducens. De qua sic Persius ait …"

59 hos P^c, uos P 62 quod *scripsi*, quam P 66 omnem P^c, omnes *(?)* P 70 Pythagoras *scripsi*, pytagoras P 76 deflectere P^c, eflectere *(?)* P 77 ad *bis repetitur*, *postea exp.* 79 limite *scripsi*, litera P 81 de mundana *scripsi*, md'ndana P 83 defluentes *p. corr.*, diffluentes *a. corr.* P

qualiter lineares, superficiales, et solidi a pari et impari in sectione illa sint positi explicemus, quod ut colliquescat, primo paucis absoluamus qui sint lineares numeri, qui superficiales, qui solidi. Omnis namque numerus per se consideratus linearis esse dicitur. Multiplicatus aut per se aut per alium, qui ex eo procreatur, superficialis nuncupatur, sed aut per se aut per alium aut partim per se partim per alium ter ducto numero soliditas numeri procreatur. Est ergo a pari binarius linearis numerus. Quaternarius uero superficialis nuncupatur, ex binario enim per se multiplicato surgit. Sed octonarius tres soliditatis dimensiones recipit, quippe qui conficitur ex binario ter ducto, quia bis bini bis sunt octo. Similiter ab impari ternarius linearis est numerus. Nouenarius est superficialis, ternarius enim bis ductus nouenarium producit—ter trium enim nouem sunt. Idem porro ternarius ter multiplicatus in XXVII numeri quantitatem accrescit—nam ter terni ter XXVII sunt. Lineares uero numeri tam a pari quam impari appositi sunt ad ostendendum quod anima mundi, id est summa opificis dei bonitas, in longum moueat tam caduca corpora quam non caduca; superficiales uero ut in latum; solidi quidem ut incomprehensibilis benignitas omnia corpora, scilicet ut sunt ea quae sunt infra lunam, et durabiliora, ut ea quae sunt in aplane, in spissum mouere crederetur.

Sciendum ⟨est⟩ numeros appellatos esse lineares uel superficiales uel solidos similitudine. Linea enim est longitudo sine latitudine, superficies uero latitudo sine spissitudine, soliditas autem crassitudo tres dimensiones obtinens: longitudinem, latitudinem, spissitudinem. Haec delibamus ne penitus ignorata huic caliginosae parti Platonis intelligentiae luculentum splendorem subripiant. Sed qui ea perfecte nosse desiderat, arismeticam non contemnat. In solidos autem haec partitio animae finita est ad demonstrandum quod [in] anima cuncta moueat solide, firme, indissolubiliter. Vel ut ostenderetur nulla esse dimensio ultra soliditatem. Expeditis illis quae proposuimus, prout in anima nobis eloqui tribuit, ad litterae seriem explanandam accedamus.

5.8 Appendix III: Hisdosus, *De anima mundi in Timaeum Platonis*: *Qualiter deus dicatur impleuisse interualla.*

NATIS ITAQVE LIMITIBVS. Hucusque ostendit Plato deum impleuisse interualla duplorum sexqualteris et sexquitertiis, quod qualiter intelligendum est pro posse nostro exposuimus. Hic autem dicit impleuisse deum interualla epitritorum omnium sexquioctauis et tonis, in quo haec consideranda

84 et *scripsi*, qui *P* 86 linearis P^c, lineares *P* 91 impari *scripsi*, impare *P* 98 est *ego suppl.* 101 *ante* intelligentiae *add.* ill, *postea exp.* 103 in *ego del.*

sunt: qualiter deus dicatur impleuisse interualla illa, qualiter illius numeri sexquitertium inueniri queat, in quibus duos tonos et semitonium minus contineri dicit Plato, in quibus primis duo toni et semitonium minus inueniri possunt. Plato itaque considerans in omni sexquitertia proportione naturaliter contineri duas sexquioctauas proportiones etiam eam quae efficit minus semitonium, et omnem proprietatem cuiuslibet eiusdem dei benignitate esse collatam non ignorans ait deum impleuisse interualla sexquitertiorum epogdois et lim⟨m⟩ate.

Illos uero numeros in quibus duos tonos continuos et lim⟨m⟩a ⟨contineri dicit Plato⟩ qui inuenire desiderat, hanc regulam artis arismeticae cordetenus retineat. Omnis multiplex numerus quoto loco distat ab unitate tot proportiones sui generis praecedit, id est duplex numerus tot sexqualteras proportiones praecedit quoto loco discedit ab unitate. Si enim primus duplus est, unam sexqualteram praecedit. Sed si in secundo loco ab unitate distat, duo. Si in tertio, tres. Similiter de triplis et quadruplis intelligite. Multiplex enim numerus dicitur qui alium uel bis uel ter uel quater uel quotienslibet continet. Sexqualterae autem proportiones dicuntur esse generis duplorum quia de duplis nascuntur sexqualterii, sexquitertiae generis triplorum quia de triplis sexquitertii procreantur. Similiter de quadruplis et sexquiquartis et aliis intelligite. Binarius ergo, quia primus duplus est, unum sexqualteram praecedit, id est in naturali numero, aut quoniam praecedit qui ad ipsum est sexqualter. Praecedit enim ternarium qui ad ipsum est sexqualter, ad quem nullus alius sexqualteram proportionem efficit. Binarius enim contra ternarium comparatus sexqualtera proportione tenetur. Qui ternarius, quia media parte caret, ad nullum sexqualter est. Sic et quaternarius, quia secundus duplus, duas sexqualteras proportiones praecedit. Praecedit enim senarium quem sequitur nouenarius, qui contra octonarium consideratus sexquioctauam proportionem reddit. Sexquioctauus enim numerus est ad numerum cum eum totum et eius octauam partem continet. Sed secundus octuplus duas sexquioctauas praecedit. Quia ergo primus non nisi unam praecedit sexquioctauam, de secundo inuestigemus utrum duos tonos et lim⟨m⟩a praeueniat.

11/15 BOETHIVS, *De institutione musica*, II, 8; ed. G. Friedlein, p. 234, 26 – p. 235, 1: "Unusquisque multiplex ab unitate scilicet computatus tot superparticulares habitudines praecedit suae scilicet in contrariam partem denominationis, quotus ipse ab unitate discesserit, hoc modo ut duplex sesqualiteras antecedat, triplex sesquitertias, quadruplex sesquiquartas, ac deinceps in hunc modum." ID., *De institutione arithmetica*, II, 2; CCSL 94A, p. 97, 14–18. Cf. GVILLELMVS DE CONCHIS, *Glosae super Platonem*, LXXXV, 12–14; CCCM 203, p. 78. RADVLPHVS LAVDVNENSIS, *De semitonio*; ed. A. Peden, *Studi mediaeualia*, 3a *serie*, 35 (1994), p. 385 [pp. 367–403]. 15/16 BOETHIVS, DE INSTITUTIONE MUSICA, I, iv; ed. G. Friedlein, p. 191, 11–13.

5 duos *scripsi*, duobus *P* 10 contineri... Plato *ego suppl.* 16 proportiones *scripsi*, proportionis *P*

Multiplicetur igitur octonarius per se ipsum. Sic octies octo LXIIII sunt. Superaddatur ergo LXIIII eius octaua pars. Surget LXXII. Octo enim LXIIII additi in LXXII excrescunt. Octaua uero pars LXXII, id est IX, eidem iuncta LXXXI reddunt. Sed horum ultimus, id est octoginta unum, non est epitritus ad priorem, id est ad LXIIII), quippe LXIIII, utpote carens parte tertia, ad nullum sexquitertia proportione comparatur. Oportet ergo hos numeros dimittere et alios sumere, quos per hanc facile quiuis reperiet regulam. Si aliquis numerus partem non habet quam uelles eum habere, per numerum a quo pars denominatur eum numerum, cuius partem uis esse, multiplica et ei quidem multiplicationi quae surget pars optata proueniet. Quia igitur LXIIII et LXXX unam sexquitertiam implere non possunt—quippe LXIIII parte tertia non tenetur—LXIIII ter multiplica, et is qui ex illa multiplicatione procreabitur tertiae partis sectionem non refugiet. Duc itaque ter LXIIII. Efficitur CXCII numerus. Partem tertiam habet necnon et octauam. Et addatur ei pars tertia. Inquiramus possintne inueniri duo toni et lim⟨m⟩a in hac epitrita proportione. Addatur itaque CXCII numero pars tertia sui, id est LXIIII. Et fiet CCLVI. Inter hos numeros duos tonos et lim⟨m⟩a—uera unitate nobis subueniente—poterimus inuenire hoc modo.

Sumatur pars octaua CXCII, id est XXIIII, et ei addatur. Fiet CCXVI. Est igitur CCXVI ad CXCII sexquioctauus. Quod autem XXIIII sint VIII pars CXCII, sic colligite. Octies XX sunt CLX. Octies IIII, XXXII. Sed CLX et XXXII sunt CXCII. Est ergo CCXVI epogdous ad CXCII. Sed si octaua pars CCXVI ei apponatur, fiet CCXLIII. Pars uero octaua CCXVI est XXVII numerus. Est itaque CCXVI ad CXCII sexquioctauus, et ad CCXVI CCXLIII. Sed CCXLIII [et CXCLIII] et CXCII non possunt unam sexquitertiam proportionem facere, quoniam tantum deest illi impletioni quantum deest comparatione habita inter CCXLIII et CCLVI, id est tredecim unitates quae, si addantur CCXLIII numero, fiet CCLVI, qui numerus epitritus est ad CXCII. In hac igitur epitrita proportione duae sexquioctauae inueniri possunt,

28/32 BOETHIVS, *De institutione musica*, II, xxviii; ed. G. Friedlein, pp. 260–261; cf. GVILLELMVS DE CONCHIS, *Glosae super Platonem*, LXXXV–LXXXVI; CCCM 203, p. 79–80. 33/35 GVILLELMVS DE CONCHIS, *Glosae super Platonem*, LXXXV, 1–5; CCCM 203, p. 79: Est alia regula artis arismeticae. Si in aliquibus numeris in aliqua proportione constitutis quaeramus partem quam non habeant, multiplicemus illos nomine partis quam quaerimus. Qui inde fient, in eadem erunt proportione et partem quam quaerimus optinebunt." Cf. BOETHIVS, *De institutione musica*, II, xxviii and xxx; ed. G. Friedlein, p. 261, 13–17 and p. 264, 23–26. Cf. *Glossa maior in Institutionem musicam Boetii*, II, xxviii (ed. C. Bower and M. Bernhard, Munich, 1994, vol. II, p. 244): "utilis regula et generalis."

34 *post* multiplica *add*. et is qui ex illa multiplicatione procreabitur, *postea exp. P* 43 sexquioctauus *scripsi*, octuplus *P*

ea quoque quae lim⟨m⟩a, id est minus semitonium, restituit, quae hoc potest dici super XIII partiens ducentesimas quadragesimas tertias, CCLVI enim numerus continet CCXLIII et insuper tredecim unitates. Haec autem proportio quae minus semitonium facit maior est quam sexquidecima nona et minor quam sexquidecima octaua et ita cadit iter sexquidecimam nonam et sexquidecimam octauam.

Illa itaque differentia quae est inter CCXLIII et CCLVI facit lim⟨m⟩a, id est minus semitonium, quae lim⟨m⟩a dicitur quasi corruptum. Lim⟨m⟩a enim corruptio interpretatur. Vnde alimma incorruptum dicitur, quoddam unguentum quo corpus perfusum ab igne inuiolatum | 21r | seruatur. Hoc se perfudit Philologia aethereas sedes ascensura, ne ei sidereus ignis noceret et corpus adhuc mortale exureret. Sed maius semitonium apotome dicitur, id est supradecisionem. Apotome enim plus est quam media pars toni. Vnum semitonium dicitur quasi imperfectus tonus. Semitonium namque est pars composita ex 'semus -ma -mum' quod est 'imperfectus -ta -tum', non a 'semis semissis' quod est medietas. Sed lim⟨m⟩a est toni minor pars, cuius lim⟨m⟩atis partes dieses apellantur. Apotomis uero partes com⟨m⟩ata nuncupantur. Qui haec omnia ad plenum nosse desiderat, Musicam Boetii studiosissime legat.

Quia ista succincte auditoribus in quadruuio rudibus expedimus, ne penitus nescita obscuritati Timaei crassis tenebris obuolutae maiorem caliginem ingerant, non sit ergo fastidiosum non ignaris quadruuii si hic uerbosius euagati sumus quam eorum iam prouecta scientia exiget. Haec enim perscribimus introducendis, non perfectis. In his autem duobus numeris, CXCII ⟨et⟩ CCLVI, duo continui

50/51 Cf. *Glossa maior in Institutionem musicam Boetii*, II, xxix (ed. C. Bower and M. Bernhard, Munich, 1994, vol. II, p. 260): "*Vt sese CCLVI ad CCXLIII habent*: CCLVI ad CCXLIII supertredecipartiens duccentessimas quadrigesimas tertias est." GVILLELMVS DE CONCHIS, *Glosae super Platonem*, LXXXVI, 2–3; CCCM 203, p. 80. 52/53 BOETHIVS, *De institutione musica*, II, xxix, ed. G. Friedlein, p. 262, 3–8. GVILLELMVS DE CONCHIS, *Glosae super Platonem*, LXXXVI, 4–7; CCCM 203, p. 80. 54/56 REMIGIVS AVTISSIODORENSIS, *Commentum in Martianum Capellam*, 46, 15; ed. C. Lutz, p. 153: "Limma Grece corruptio, *alimma* uero incorruptum siue incontaminatum sonat." Cf. ERIVGENA, *Annotationes in Martianum*, 46, 16; ed. C. Lutz, p. 58: "Limma corruptio, *alimma* incontaminatum. Per alimmata omnes intellige uirtutes quibus liberatur anima ab aeternis ardoribus." 56/58 MARTIANVS CAPELLA, *De nuptiis* II, 109–110. 58/59 BOETHIVS, *De institutione musica*, II, xxx; ed. G. Friedlein, p. 263, 21–22: "Reliqua igitur pars, quae maior est apotome nuncupatur a Graecis, a nobis uero potest decisio." 59/61 BOETHIVS, *De institutione musica*, I, xvi; ed. G. Friedlein, p. 203, 8–10: "Sed utraque semitonia nuncupantur, non quod omnino semitonia ex aequo sint media, sed quod semum dicit solet, quod ad integritatem usque non peruenit." 61 BOETHIVS, *De institutione musica*, I, xxi; ed. G. Friedlein, p. 213, 17: "diesis autem est semitonii dimidium." 61/62 BOETHIVS, *De institutione musica*, III, vi; ed. G. Friedlein, p. 277.

50 *fortasse* sic *pro* hoc *legendum?* 55 alimma *scripsi*, alimau *P* 56 unguentum *scripsi*, ungentum *P* 58 apotome *scripsi*, aphotome *P* || apotome *scripsi*, aphotome *P* 61 apotomis *scripsi*, aphotonies *P* 62 commata *scripsi*, comota *P* || nuncupantur *scripsi*, nuncupatur *P* 64 quadruuio *p. corr.*, conuiuio *a. corr. P* 66 si hic uerbosius *scripsi*, sine his uerbosis *P* 67 et *ego suppl.*

toni et lim⟨m⟩a reperiri possunt, quod uolens significare Plato posuit illos inter quos minus semitonium primo inueniri potest.

Fortasse aliquis dicat: Prior de duabus regulis datis superius ad inueniendos tonos duos continuos et lim⟨m⟩a nil utilitatis affert, quia secundum eam non extenduntur hic duae sexquioctauae, cum illa dicat, quoto loco distat ab unitate aliquis multiplex numerus, eum tot proportiones sui generis praecedere. Secundum illam regulam, inquam, non extenduntur, quod sic probari potest. CXCII nullo loco distat ab unitate, non enim in primo loco ab ea discedit. Imo octonarius est primus octuplus, secundus autem est LXIIII, tertius uero est CCCCCXII. Cum ergo nullo loco ab unitate discesserit iste octuplus, id est CXCII, quomodo ad eum inueniendum ista regula est utilis? Ad hoc respondemus regulam illam parum prodesse sine aliqua subsequente, sed per illas duas facile inueniri posse duos tonos et semitonium.

Vel aliter dicimus uerum esse quod nullo loco distat ab unitate CXCII octuplus numerus, sed a ternario et in secundo loco ab eodem distat. Ternario enim XXIIII numerus est octuplus. Octies enim tria XXIIII restituunt. Sed ad XXIIII CXCII octupla habitudine comparatur. Namque XXIIII numerus octies ductus in summam CXCII excrescit. Licet igitur a ternario in secundo loco distet CXCII numerus, nullo tamen ab unitate, ad duos tonos continuos inueniendos et lim⟨m⟩a ualde illa regula necessaria est. Quomodo enim 'ab unitate' dicit, similiter intelligendum est de quolibet numero naturali unitatem sequente, ut sic intelligatur regula. Omnis multiplex numerus quoto loco distat ab unitate—et subintelligite uel a binario uel a ternario uel a quaternario et similiter a quolibet sequentium numerorum—tot proportiones sui generis praecedit. Nec sic intellecta haec regula alicubi fallit. Cum ergo a ternario CXCII numerus distet secundo loco, ad inueniendos tonos continuos et lim⟨m⟩a perutilis esse ostenditur superius data regula.

Quoniam expeditum est qualiter intelligendum sit quod Plato dicit deum impleuisse interualla epitritorum omnium epogdois et lim⟨m⟩ate, qualiter inueniantur illi numeri, inter quos continentur duo toni et semitonium, et in quibus duo toni reperiantur et lim⟨m⟩a, ad litteram accedamus, prius tamen descriptione oculis subdita in qua duo toni et lim⟨m⟩a inter duos epitritos contineantur ut quaecumque dicta sunt de tonis et lim⟨m⟩ate, in arca memoriae abscondita, nec obliuio demoliri nec inutilium curarum agmen possit surripere, et tantae rei subtilitas nequeat effugere.

68 uolens *p. corr.*, uobis *a. corr. P* 75 CCCCCXII *scripsi*, CCCCCXXII *P* 94 demoliri *p. corr.*, demolliri *a. corr. P* || nec *scripsi*, ne *P*

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